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— 9 —

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## ADVERTISEMENT.

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This work is the ninth of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

JOSEPH HENRY,

*Secretary of the Smithsonian Institution.*

SMITHSONIAN INSTITUTION,

*Washington, May, 1877.*

CONTRIBUTIONS

TO

NORTH AMERICAN ICHTHYOLOGY.

BASED PRIMARILY ON THE

COLLECTIONS OF THE UNITED STATES NATIONAL MUSEUM.

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I.

REVIEW OF RAFINESQUE'S MEMOIRS ON NORTH AMERICAN FISHES

BY

DAVID S. JORDAN.

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WASHINGTON:  
GOVERNMENT PRINTING OFFICE.  
1877.

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## P R E F A C E.

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The purpose of this paper is to present a series of identifications of the species of fresh-water fishes described by Rafinesque in his "Ichthyologia Ohiensis" and elsewhere, made as a result of nearly three years of "field-work" in the region fished in by Rafinesque. In most cases, fresh specimens have been carefully compared with Rafinesque's accounts, and in the more difficult groups, as the *Cyprinidæ*, *Catostomidæ*, and *Centrarchidæ*, I have taken a full series of the species known to occur in this region and compared Rafinesque's description with each specimen in turn, until one was reached which showed no serious discrepancy.

It is evident that many of Rafinesque's descriptions were drawn up from memory, and that his measurements were made by the eye, without the restraint of a tape-line. He indeed somewhere states that his collections were made in the summer and accounts written up for publication during the winter. As a result of this, the descriptions are often inexact, although usually striking. The numerous misprints in his work are also, in some cases, a source of confusion.

By making due allowance for these facts, and keeping in mind the proposition, unjustly controverted by some writers, that Rafinesque was not altogether a knave nor a fool, I have succeeded in identifying more or less satisfactorily, nearly all of his species, and in restoring to a number of his names their rightful priority.

The species still remaining unidentified are of two sorts: First, species really existing but not distinctively described, as *Luxilus interruptus*, *Rutilus compressus*, etc., in which no really tangible characters are given; and, second, those like *Aplocentrus calliops* and *Pogostoma leucops*, described at second hand from "drawings by Mr. Audubon", presenting, a grouping of characters applicable to no known fish.

It is not my purpose here to enter into any discussion of the merits of Rafinesque's work. That the Ichthyologia has been, and still is, a stumbling-block, is generally admitted. This is partly owing to errors of observation on the part of the author, partly to the admixture of statements derived from memory, imagination, or hearsay with statements of fact, and, finally, in no slight degree to the fact that Rafinesque's

accounts were taken from living fishes, and hence were not to be readily interpreted by workers in the closet with preserved specimens.

In order to do justice to Rafinesque's work, it is necessary, in the words of Girard (Proc. Ac. Nat. Sc. Phil. 1856, 167), "that one should go to the very ground trodden by Rafinesque himself, his book in hand, during all seasons of the year, aye, even for years in succession, to enable us to discriminate between what Rafinesque really observed and what is imaginary".

Rafinesque's work has been well summed up by Professor Agassiz:

"Nothing is more to be regretted for the progress of natural history in this country than that Rafinesque did not put up somewhere a collection of all the genera and species he had established, with well-authenticated labels, or that his contemporaries did not follow in his steps, or at least preserve the tradition of his doings, instead of decrying him and appealing to foreign authority against him. Tracing his course as a naturalist during his residence in this country, it is plain that he alarmed those with whom he had intercourse, by his innovations, and that they preferred to lean upon the authority of the great naturalists of the age, then residing in Europe, who, however, knew little of the special natural history of this country, than to trust a somewhat hasty man who was living among them, and who had collected a vast amount of information from all parts of the States, upon a variety of objects then entirely new to science. From what I can learn of Rafinesque, I am satisfied that he was a better man than he appeared. His misfortune was his prurient desire for novelties and his rashness in publishing them, and yet both in Europe and America he has anticipated most of his contemporaries in the discovery of new genera and species in those departments of science which he has cultivated most perseveringly, and it is but justice to restore them to him, whenever it can be done". (Am. Journ. Sc. Arts, 1854, p. 354.)

In regard to the descriptions of fishes made by Rafinesque from "drawings by Mr. Audubon", I am informed by Dr. Kirtland, on the excellent authority of Dr. Bachman, that several of the monsters described by Rafinesque (such as *Aplocentrus*, *Pogostoma*, *Eurystomus*, etc.) were drawn by Audubon with a view to a practical joke on the too credulous ichthyologist. That being the case, it is but justice to Rafinesque's memory to let those names drop from our systematic lists without prejudice to him.

The work known as the "Ichthyologia Ohiensis" was originally published as a serial in the "Western Review and Miscellaneous Magazine", Lexington, Ky., from December, 1819, to November, 1820. This fact of publication by parts should be kept in mind, as, in one case at least (that of *Aplesion*), it may affect our nomenclature.

The following are the dates of publication, for which I am indebted to Professor Gill :

Vol.	No.	Date.	W. R. & M. M.	I. O.
			<i>Page.</i>	<i>Page.</i>
I.	I.	December, 1819 .....	305-313	1-13
	II.	January, 1820 .....	361-377	13-29
	III.	February (?), 1820 .....	?-57	?-37
II.	IV.	April, 1820 .....	169-177	37-45
	V.	May, 1820 .....	?-243	45-53
	VI.	June, 1820 .....	299-307	53-60
	VII.	July, 1820 .....	355-363	61-69
III.	VIII.	October, 1820 .....	165-173	69-77
	IX.	November, 1820 .....	244-252	77-84

Quite a number of genera and species of American fresh-water fishes were described by Rafinesque in other publications previous to the appearance of the *Ichthyologia*. I give a list of all these known to me, with identifications. I exclude all names merely catalogued without explanation, as having no claims upon our attention. In some cases, a species was catalogued under one name and finally described under some other.

I have next inserted a complete catalogue of Rafinesquian genera, arranged in chronological order, with their equivalents in the nomenclature which I at present adopt.

The body of this paper consists of a list of the genera, subgenera, and species of the *Ichthyologia*, arranged in the sequence adopted by Rafinesque, with the names, English, Latin, and French, as he gave them, the misprints corrected by him in the "Errata" being here rectified. The page in the *Ichthyologia* in which each description occurs is added for the benefit of compilers of synonymy. Next comes my identification, with a partial synonymy of the species, the name which I adopt being printed in capitals. In a subsequent paper on the fishes of the Ohio Basin, the synonymy will be given in full, for which reason I have preferred not to insert it here.

In all cases where the recognition of Rafinesque's genera or species will render necessary a change in the current nomenclature, I have added Rafinesque's description as a foot-note, that the reader may see the grounds on which the identification is based. In such cases, I have usually italicized the salient points.

Finally, a list of the species now found in the valley of the Ohio, which do not appear to have been known to Rafinesque, completes the memoir.

This paper was originally prepared for the press in the spring of 1876. Most of the changes in nomenclature here discussed have been adopted by the author in different papers on fishes, and they have generally received the sanction of American workers in ichthyology. The manuscript of the paper has been since retouched, some untenable positions have been abandoned, and some further changes suggested by Professors Cope and Gill have been introduced.



I.—LIST OF RAFINESQUIAN GENERA AND SUBGENERA,  
WITH THEIR EQUIVALENTS IN THE ADOPTED NOMEN-  
CLATURE.

I give here a catalogue in chronological order of the generic and sub-generic names proposed by Rafinesque for our fresh-water fishes, with the type of each where any type is either designated or in any definite way implied, with its equivalence in the nomenclature which the writer at present adopts. The reasons for the use or non-use of these names will appear farther on. Those names originally proposed for subgenera are designated by a star (\*).

Rafinesquian genera.	Type species.	Modern genera.
1818.		
Notropis	atherinoides.	Nototropis (= <i>Minnilus</i> = <i>Alburnellus</i> ).
Glossodon	harengoides.	Hyodon.
Litholepis	adamantinus.	Litholepis ( <i>Atractosteus</i> ).
Dinoctus	truncatus.	Acipenser L.
Pogostoma	leucops.	A myth!
Pomoxis	annularis.	Pomoxys.
Noturus	flavus.	Noturus.
Sarchirus	vittatus.	Lepidosteus.
Exoglossum	lesurianum.	Exoglossum.
Maxillingua*	lesurianum.	Exoglossum.
Hypentelium*	macropterum.	Hypentelium ( <i>Hylomy- zon</i> Ag.).
1819.		
Aplodinotus	grunniens.	Haplodonotus.
Etheostoma	flabellaris.	Etheostoma ( <i>Catono- tus</i> ).
Leucops	leucops.	A myth!
Aplocentrus	calliops.	A myth!
Calliurus	punctulatus.	Micropterus.
Lepomis	auritus L.	Lepiopus.
Pomotis*	auritus L.	Lepiopus.

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Rafinesquian genera.	Type species.	Modern genera.
Apomotis *	cyanellus.	Apomotis.
Notemigonus	auratus.	Notemigonus ( <i>Stilbe</i> ).
Amphiodon	“alveoides” (alosoides).	Hyodon.
Ambiodon	bubalus (teeth of <i>grun-niens</i> ).	Ichthyobus and Haploidonotus.
Cycleptus	nigrescens.	Cycleptus.
Pylodictis	limosus.	Pelodichthys ( <i>Hopladelus</i> ).

1820.

Stizostedion *	salmouea.	Stizostethium
Lepibema *	chrysops.	Roccus Mitchill, 1817.
Pomacampsis *	nigropunctata.	Stizostethium.
Ichthelis	auritus L.	Lepiopomus.
Telipomis *	—	Apomotis ( <i>Bryttus</i> C. & V.).
Aplites *	pallida.	Micropterus Lac.
Nemocampsis *	flexuolaris.	Micropterus Lac.
Dioplites *	salmouea.	Micropterus Lac.
Ambloplites *	ichtheloides.	Ambloplites.
Aplesion *	calliura.	Micropterus Lacép.
Diplesion *	blennioides.	Diplesium ( <i>Hyostoma</i> Ag., 1854).
Pomolobus	chrysochloris.	Pomolobus.
Dorosoma	notata.	Dorysoma ( <i>Chatoëssus</i> Cuv. & Val., 1829).
Clodalus *	clodalus (Le S.)	Hyodon Le S.
Minnilus	—	Nototropis.
Alburnus	alburnus L. (European).	Alburnus (Heckel emend., 1843).
Phoxinus	phoxinus L. (European).	Phoxinus (Agassiz emend., 184-).
Dobula	dobula L. (European).	? Squalius Bonaparte, 1841.
Hemiplus (181-).	— (European?).	—.
Luxilus	chrysocephalus.	Luxilus ( <i>Hypsilepis</i> Baird, 1854).

Rafinesquian genera.	Type species.	Modern genera.
Chrosomus	erythrogaster.	Chrosomus.
Semotilus	dorsalis.	Semotilus.
Rutilus	rutilus L. (European).	Leuciscus Klein, 17—.
Plargyrus	rutilus L.	Leuciscus.
Pimephales	promelas.	Pimephales.
Moxostoma *	anisurus.	Myxostoma ( <i>Ptychostomus</i> ).
Ictiobus *	bubalus.	Ichthyobus.
Carpiodes *	————	Carpiodes.
Teretulus *	————	Myxostoma.
Eurystomus *	megastomus.	? A myth.
Decactylus *	————	Catostomus, etc.
Cycleptus	nigrescens.	Cycleptus.
Ictalurus *	————	Ichthælorus.
Elliops *	maculatus.	Ichthælorus.
Ameiurus *	————	Amiurus.
Ilictis *	limosus.	Pelodichthys.
Leptops *	viscosus.	Pelodichthys.
Opladelus *	nebulosus.	Pelodichthys.
Picorellus *	vittatus.	Esox.
Cylindrosteus *	platostomus.	Lepidosteus.
Atractosteus *	ferox.	Litholepis, 1818.
Sturio *	————	Acipenser L.
Sterletus *	serotinus.	Acipenser L.
Dinectus	truncatus.	Acipenser L.
Pegedictis	ictalops.	Etheostoma ( <i>Catonotus</i> ).
Proceros	maculatus.	A myth.

## II.—LIST OF SPECIES DESCRIBED PRIOR TO THE ICHTHY- OLOGIA OHIENSIS.

I give here a list of the papers known to me in which descriptions by Rafinesque, prior to those in the *Ichthyologia*, occur, with the names of the species so described, the page on which the descriptions occur, and my identification of the species.



VI. Discoveries in Natural History, made during a Journey through the Western Region of the United States by Constantine Samuel Rafinesque, esq. Addressed to Samuel L. Mitchill, President, and other members of the Lyceum of Natural History in a letter dated at Louisville, Falls of the Ohio, 20th July, 1818. <American Monthly Magazine and Critical Review, September, 1818. \*(Twenty-six species recorded, the following described at some length:)

- Glossodon harengoides. 354=Hyodon tergisus Le Sueur.  
 Glossodon heterurus... 354=Hyodon tergisus Le Sueur.  
 Perca salmonea..... 354=Stizostethium salmoneum Raf.  
 Sciaena caprodes..... 354=Percina caprodes (Raf.) Grd.  
 Silurus punctatus..... 354=Ichthælorus punctatus (Raf.) Jor.  
 Silurus olivaris... . . . 354=Pelodichthys olivaris (Raf.) Gill  
 & Jor.  
 Catostomus bubalus... 354=Ichthyobus bubalus Raf.  
 Catostomus erythrurus. 354=Myxostoma duquesnii (Le S.) Jor.  
 Clupea heterurus..... 354=Dorysomacepediana heterura (Raf.)  
 Jor.

\* The following is the catalogue as given in this paper:

Perca salmonea .....	Salmon.
Perca chrysops .....	Rockfish.
Sciaena grunniens .....	White Perch.
Sciaena caprodes.....	Hog Fish.
Bodianus calliurus .....	Bass.
Sparus cyanelus.....	Sun Fish.
Sparus nigropunctatus .....	Bachelor Perch.
Silurus punctatus .....	Mud Cat Fish.
Silurus olivaris.....	Yellow Cat Fish.
Silurus amblodon .....	Black Cat Fish.
Catostomus bubalus.....	Buffaloe Fish.
Catostomus erythrurus .....	Red Horse.
Catostomus macropterus.....	Carp.
Catostomus duquesnei.....	Sucker.
Clupea heterurus.....	Gizzard.
Clupea alosoides .....	Shad.
Glossodon harengoides.....	Spring Herring.
Glossodon heterurus.....	Summer Herring.
Hydrargyra dinema.....	Minnny.
Hydrargyra notata.....	Chub.
Hydrargyra amblops .....	White Chub.
Lepisosteus fluviatilis .....	Gar Fish.
Polyodon folium .....	Shovel Fish.
Polyodon pristin.....	Spade Fish.
Acipenser platyrhynchus.....	Sturgeon.
Silurus pallidus .....	White Cat.

Not seen yet: Pike, Eels, Lamprey, Black Perch, Yellow Perch, Red Perch.

VII. Further discoveries in Natural History, made during a journey through the Western Region of the United States, by Constantine Samuel Rafinesque, esq. <American Monthly Magazine and Critical Review, October, p. 445. (Describes new genera *Litholepis*, *Dinoctus* and *Pogostoma*, and mentions without description the typical species of each.)

Twenty-two species are catalogued and three species are described, as follows:\*

<i>Anguilla laticauda</i> .....	445=	<i>Anguilla vulgaris</i> Fleming.
<i>Esox vittatus</i> .....	445=	Unidentified.
<i>Bodianus calliops</i> .....	445=	A myth.

VIII. Further account of Discoveries in Natural History in the Western States, by Coustantine Samuel Rafinesque, esq. Communicated in a letter from that gentleman to the editor, Lexington, October 5, 1818. <American Monthly Magazine and Critical Review, November, 1818. (Three new genera described and the typical species of each:)

<i>Pomoxis annularis</i> .....	41=	<i>Pomoxys annularis</i> .
<i>Noturus flavus</i> .....	41=	<i>Noturus flavus</i> Raf.
<i>Sarchirus vittatus</i> .....	41=	<i>Lepidosteus osseus</i> (L.) Ag.

\*The following are the species added to the catalogue in this paper:

<i>Lepisosteus platostomus</i> .....	Alligator Fish.
<i>Lepisosteus stenorhynchus</i> .....	Gar Fish.
<i>Anguilla laticauda</i> .....	Ohio Eel.
<i>Cyprinus fasciolaris</i> .....	Mullet.
<i>Cyprinus trachiaphas</i> .....	Brown Mullet.
<i>Exoglossum argentum</i> .....	White Chub.
<i>Olmerus albula</i> .....	White Fish.
<i>Bodianus calliops</i> .....	Bride Perch.
<i>Pogostoma leucops</i> .....	White Eye.
<i>Esox vittatus</i> .....	Jack Pike.
<i>Esox fasciolaris</i> .....	Salmon Pike.
<i>Catostomus amisopterus</i> .....	Perch Buffalo.
<i>Catostomus ambledon</i> .....	Black Buffalo.
<i>Catostomus velifer</i> .....	Sailor Fish.
<i>Glossodon chrysops</i> .....	Gold Eye Herring.
<i>Clupea chrysochloris</i> .....	Golden Shad.
<i>Silurus pallidus</i> .....	White Cat Fish.
<i>Silurus cerulescens</i> .....	Blue Cat Fish.
<i>Glanis limosus</i> .....	Mud Cat Fish.
<i>Accipenser heptipus</i> .....	Brown Sturgeon.
<i>Dinoctus truneatus</i> .....	Blunt-nose Sturgeon.
<i>Litholepis adamantinus</i> .....	Diamond Fish or Devil Jack.

IX. Description of three new Genera of Fluvial Fish, *Pomoxis*, *Sarchirus*, and *Exoglossum*. <Journal of Philadelphia Academy of Natural Sciences, November, 1818.

- Pomoxis annularis*..... 417=*Pomoxys annularis* Raf.  
*Sarchirus vittatus*..... 419=*Lepidosteus osseus* (Lac.) Ag. (juv.)  
*Exoglossum macropt-*  
*rum* ..... 420=*Hypentelium nigricans* (Le S.) Jor.  
*Exoglossum annulatum* 421=*Exoglossum maxillingua* (Le S.)  
Hald.  
*Exoglossum nigrescens*. 422=*Exoglossum maxillingua*.  
*Exoglossum lesurianum*. 420=*Exoglossum maxillingua*.

X. Description of a new Genus of Fresh-Water Fish, *Exoglossum*. <Silliman's American Journal of Science and Arts, 1819.

- Exoglossum vittatum* .. 156=*Exoglossum maxillingua*.  
*Exoglossum annulatum*. 156=*Exoglossum maxillingua*.

XI. Prodrome de 70 nouveaux Genres d'Animaux découverts dans l'intérieur des États-Unis d'Amérique durant l'année 1818. <Journal de Physique, de Chimie et d'Histoire Naturelle, June, 1819.

- Aplodinotus grunniens*. 419=*Haplodonotus grunniens* Raf.  
*Etheostoma flabellaris*.. 419=*Etheostoma flabellaris* Raf. (*Cat-*  
*notus* Ag.).  
*Etheostoma caprodes*... 419=*Percina caprodes* (Raf.) Grd.  
*Etheostoma blennioides*. 419=*Diplesium blennioides* (Raf.) Jor.  
*Pogostoma leucops*,.... 419=A myth!  
*Aplocentrus calliops*... 420=A myth!  
*Calliurus punctulatus*.. 420=*Micropterus salmoides* (Lac.) Gill.  
*Lepomis cyanellus*.... 420=*Apomotis cyanellus* (Raf.) Cope &  
Jor. (*Bryttus mineopas* Cope).  
*Lepomis macrochirus* .. 420=*Lepiopus macrochirus* Raf.  
(*nephelus* Cope).  
*Notemigonus auratus*... 421=*Notemigonus americanus* (Lac.)  
Jor.  
*Amphiodon alveoides*.. 421=*Hyodon tergisus* Le S.  
*Ambiodon bubalus*..... 421=*Ichthyobus bubalus* (Raf.) Ag. (in  
part).  
*Ambiodon niger*..... 421=*Bubalichthys niger* (Raf.) Ag.

- Cycleptus nigrescens*... 421=*Cycleptus elongatus* (Le S.) Ag.  
*Noturus luteus*..... 421=*Noturus flavus* Raf.  
*Pilodictis limosus*..... 422=*Pelodichthys olivaris* (Raf.) Gill &  
 Jor.

*Litholepis adamantinus*. 422=*Litholepis spatula* (Lac.) Jor.

XII. Description of the Silures or Cat-Fishes of the River Ohio, by C. S. Rafinesque, Professor of Botany in the Transylvania University of Lexington, Kentucky. <Quarterly Journal of Science, Literature and Arts, Royal Institution, London, 1820, ix.

- Silurus maculatus*... 48=*Ichthælorus punctatus* (Raf.) Jor.  
 var. *erythroptera*..... 49=*Ichthælorus punctatus* (Raf.) Jor.  
*Silurus pallidus* ..... 49=*Ichthælorus punctatus*.  
 var. *marginatus* ..... 49=*Ichthælorus punctatus*.  
 var. *lateralis* ..... 49=*Ichthælorus punctatus*.  
 var. *leucoptera* ..... 49=*Ichthælorus punctatus*.  
*Silurus cerulescens*..... 49=*Ichthælorus punctatus*.  
 var. *melanurus*..... 49=*Ichthælorus punctatus*.  
*Silurus argentinus*..... 50=*Ichthælorus punctatus*.  
*Silurus nebulosus*..... 50=*Pelodichthys olivaris* (Raf.) G.  
 & J.  
*Silurus viscosus*..... 50=*Pelodichthys olivaris*.  
*Silurus lividus*..... 51=*Amiurus lividus* (Raf.) Jor.  
 var. *fuscatus*..... 51=*Amiurus lividus*.  
*Silurus melas*..... 51=*Amiurus melas* (Raf.) Jor. & Cope-  
 land.  
*Silurus cupreus*..... 51=*Amiurus lividus cupreus* (Raf.)  
 Jor.  
*Silurus xanthocephalus*.. 51=*Amiurus xanthocephalus* (Raf.)  
 Gill.  
*Silurus limosus*..... 51=*Pelodichthys olivaris*.

### III.—ICHTHYOLOGIA OHIENSIS.

Ichthyologia Ohiensis | or | Natural History | of | the Fishes Inhabiting the | River Ohio | and its Tributary Streams | Preceded by a physical description of the Ohio and its branches | by C. S. Rafinesque, | — | Professor of Botany and Natural History in Transylvania University, Author of the Analysis of Nature, &c., &c., member of the Literary and Philosophical Society of New York, the Historical Society of New York, the Lyceum of Natural History of New York, the Academy of Sciences of Philadelphia, the American Antiquarian Society, the Royal Institute of Natural Sciences of Naples, the Italian Society of Arts and Sciences, the Medical Societies of Lexington and Cin-



cinnati, &c., &c. | — | The art of seeing well, or of noticing and distinguishing with accuracy the objects which we perceive is a high faculty of the mind, unfolded in few individuals, and despised by those who can neither acquire it, nor appreciate its results | — | Lexington, Kentucky | printed for the Author by W. G. Hunt (price one dollar). | — | 1820 | (1 vol., 8vo, 90 pp.)

On the reverse of the title-page :

These Pages | and the Discoveries which they contain | in one of the principal Branches | of Natural History, | are respectfully Inscribed | by the Author | To his fellow-labourers in the same field of Science | Prof. Samuel L. Mitchill, M. D. | who has described the Atlantic Fishes of New York, | and to | C. A. Le Sueur, | who was the first to explore the Ichthyology of the Great American Lakes, &c. | In Token | of Friendship, Respect, and Congratulation.

I. Genus, **PERCH, PERCA, Perche.** (p. 20.)

1st species, **Salmon-Perch, PERCA SALMONEA, Perche Saumone.** (p. 21.)

**STIZOSTETHIUM SALMONEUM** Raf., Cope, etc.

A fair description, as Professor Cope has shown. This fish is probably distinct from *S. vitreum*, although the two species are closely related. On page 23, Rafinesque suggests that *P. salmonea* forms a peculiar subgenus or genus which may be called *Stizostedion*. This name antedates *Lucioperca* of Cuvier, and has been generally adopted by recent American authors.

2d species, **Golden-Eyes Perch, PERCA CHRYSOPS, Perche-œil-d'or.** (p. 22.)

**ROCCUS CHRYSOPS** (Raf.) Gill.

Description not quite accurate but recognizable. On page 23 the subgeneric name of *Lepibema* is proposed for it, but *Roccus* of Mitchill is older. *Lepibema* may be retained as the name of a subgenus of *Roccus*, the body being shorter and deeper and the dentition somewhat different.

3d species, **Black-dotted Perch, PERCA NIGROPUNCTATA, Perche a points-noirs.** (p. 23.)

An unrecognizable description, based, as nearly all of Rafinesque's worst descriptions are, "on a drawing" of Mr. Audubon. The original may have been *Percina caprodes*, *Stizostethium canadense*, or nothing. Rafinesque proposes for it the generic name of *Pomacampsis*.

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II. Genus, **BUBBLER, AMBLODON**, *Amblodon*. (p. 24.)

= *Aplodinotus* Rafinesque, 1819.

= *Haploidonotus* Gill, 1861.

4th species, Grunting Bubbler, **AMBLODON GRUNNIENS**, *Amblodon grognant*. (p. 24.)

**HAPLOIDONOTUS GRUNNIENS** Raf.

*Corvina oscula* Cuv. & Val., 1830.

*Corvina grisea* Dekay, 1842.

*Amblodon grunniens* Agassiz, 1854.

A very good description.

III. Genus, **PAINTED TAIL**, *Calliure*. (p. 26.)

*Micropterus* Lacépède, not *Calliurus* Agassiz, Girard, etc. = *Chænobryttus* Gill.

5th species, Dotted Painted Tail, **CALLIURUS PUNCTULATUS**, *Calliure pointille*.

**MICROPTERUS SALMOIDES** (Lacép.) Gill.

The peculiar coloration of the caudal fin which suggested the name *Calliurus*, "base yellow, middle blackish, tip white", belongs among Ohio fishes only to the young of the Black Bass. *Calliurus*, therefore, as shown by Professor Gill, is a synonym of *Micropterus*, and cannot be applied to a distinct genus.

IV. Genus, **SUNFISH, ICTHELIS**, *Ichthele*. (p. 27.)

= **LEPOMIS** Raf., 1819.

1st subgenus, **TELIPOMIS**. (p. 27.)

= **APOMOTIS** Raf., 1819 = *Bryttus* C. & V., 1831.

\* 6th species, Gilded Sunfish, **ICTHELIS MACROCHIRA**, *Ichthele macrochire*. (p. 27.)

**LEPIOPOMUS MACROCHIRUS** Raf.

*Lepomis nephelus* Cope.

This description applies perfectly to *Lepomis nephelus* Cope, a rather

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\* Body oval, oblong, gilt, crowded with small brown dots; head small, scaly, opercule flexuose, spot narrow, marginal, and black; jaws equal; tail forked; pectoral fins long and narrow, reaching the anal fin, which has 13 rays, whereof 3 are spiny.

A pretty species from three to four inches long. In the Ohio, Green River, Wabash, &c. Names, Sun-fish, Gold-fish, &c. Head rather acute, not scaly before the eyes. Iris gilt brown. Dorsal fin with 22 long rays, whereof 11 are spiny; a depression between the two sorts of rays. Anal fin broad and rounded. Tail 20 rays. Thoracic 1 and 5. Pectoral 15. Diameter of the body nearly one-fourth of total length (with caudal).

common species in Southern Ohio and Indiana. *Pomotis macrochira* Kirtland is based, in part at least, on *Lepomis pallidus* (Mitch.). *Ichthelis macrochira* Jordan (Man. Vert.) is a *Xenotis*, to which I have since given the name of *X. aureolus*.

\* 7th species, Blue Sunfish, **ICTHELIS CYANELLA**, *Ichthele bleuatre*.

APOMOTIS CYANELLUS Raf.

*Bryttus punctatus* Cuv. & Val.

*Calliurus longulus* Girard.

*Calliurus formosus* Girard.

*Calliurus longulus* Bliss (*in lit.*—specimens identified).

*Chænobryttus mineopas* Cope.

*Ichthelis melanops* Raf. (*Chænobryttus melanops* Cope, not of Gill.)

Rafinesque's description, although erroneous in one or two particulars, refers to a species of *Apomotis*, and the name *cyanella* has priority over all others. As in nearly every case the "diameter" is made too small; evidently Rafinesque trusted his eyes in such cases instead of a tape-line.

† 8th species, Black-Eye Sunfish, **ICTHELIS MELANOPS**, *Ichthele œuil-noir*.

APOMOTIS CYANELLUS Raf.

Description somewhat erroneous, but characteristic.

\* Body *elliptical, elongate*, diameter one-fifth, *olivaceous gilt, crowded with irregular blue dots; brownish above; head elongate, lower jaw longer, cheeks with blue flexuose lines; spot oblong, blackish, nearly marginal; tail rounded, notched; anal fin very broad with 12 rays, whereof three are short spiny; pectoral fins very short.*

A small species hardly three inches, called Blue-fish or Sun-fish. I found it on the Ohio at the falls. *Appearing entirely blue at a distance.* Head brown above; iris gilt; opercle curved; tail olive-blue with 24 rays. Dorsal fin brownish with 20 rays, whereof 10 are spiny, hardly any middle depression. Pectorals small trapezoidal, 12 rays. Thoracic one and five.

† *Body oblong, diameter one-fourth, olivaceous, covered with blue dots, neck brown above, head large, mouth rather large, upper jaw longer; opercule with blue curved and longitudinal lines beneath; spot rounded, black at its base; fins olivaceous, tail bilobed; anal fin with three and nine rays; pectoral fins large oboval.*

Length from 2 to 6 inches; common in the tributary streams of the Ohio, the Kentucky, Licking, Miami, &c., and even in small creeks. Vulgar names, Blue-fish, Black-eyes, Sun-fish, Blue-bass, &c. It has black eyes (pupils) like all the other species, but the iris is black also, with a silvery hue or ring. Dorsal fin with 10 and 10 rays, *the spiny ones very short.* Caudal 20. Pectoral 16. Thoracic 1 and 5 as usual, but the spiny ray is very short, as are also those of the anal fin.

## 2d subgenus, POMOTIS. (p. 28.)

9th species, Red-Eye Sunfish, **ICTHELIS ERYTHROPS**, *Ichthele œuil-rouge*. (p. 29.)

**AMPLOPLITES RUPESTRIS** (Raf.) Gill.

*Bodianus rupestris* Rafinesque, 1818.

Description fair. The name *Pomotis*, first proposed in 1819, is a mere synonym of *Lepomis*.

\* 10th species, Eared Sunfish, **ICTHELIS AURITA**, *Ichthele oreilleuse*.

**XENOTIS LYTHROCHLORIS** Jordan. *nom. sp. nov.*

Not *Pomotis auritus* ("L.") Günther.

= *Lepomis auritus* Cope. (Not of Raf. 1818.)

11th species, Big-Ear Sunfish, **ICTHELIS MEGALOTIS**, †*Ichthele megalote*. (p. 29.)

**XENOTIS MEGALOTIS** (Raf.) Jordan.

*Pomotis nitidus* Kirtland.

Not *Ichthelis incisor* (C. & V.) Holbr.

Not *Lepomis megalotis* Cope.

*Ichthelis megalotis* Raf., Bliss (*in lit.*).

Description pretty good. This cannot be the *Lepiopomus pallidus* (*incisor*), as has been supposed by Professor Cope.

**V. Genus, RIVER-BASS, LEPOMIS**, *Lepome*. (p. 30.)

= *Micropterus* Lacépède.

Not *Lepomis* Raf., 1819.

\* Body oval elliptic (diameter one-third), *olivaceous with blue and rufous dots*; head small, jaws equal, opercle flexuose, appendage black, broad and truncate, some blue flexuose lines on the side of the head; tail brownish lunulate; back brownish; anal fin 3 and 9; pectorals not reaching the vent. Thoracics mucronate.

Length from 3 to 12 inches; common in the rivers, creeks, and ponds of Kentucky. Vulgar name, Sunfish. Iris brown. Dorsal fin brownish, 10 and 10, *spiny rays shorter*, thoracic fins very long; spiny rays rather shorter, first soft ray mucronate; pectorals nearly rhomboidal with 14 rays, tail 16 rays.

† Body oval, rounded (diameter two-fifths), *chestnut color with blue dots, belly red*; head large, lower jaw longer, opercle with blue flexuose lines, appendage black, very large elliptic, end rounded; tail black, slightly forked, pectoral large, reaching the vent; anal fin 3 and 9; thoracics long and mucronate; black tail.

A fine species, called Red-belly, Black-ears, Black-tail Sun-fish, &c. It lives in the Kentucky, Licking, and Sandy Rivers, &c. Length from 4 to 8 inches. *Head very sloping*, iris silvery brown, *belly of a bright copper red color*. All the fins black except the pectorals, which are olivaceous, trapezoidal, acute and large. The dorsal has 20 rays, whereof 9 short ones are spiny. *Body very short, hardly as long as broad, if the head and tail are deducted*. Thoracics like those of the foregoing species.

1st subgenus, **APLITES**. (p. 30.)

12th species, Pale River-Bass, **LEPOMIS PALLIDA**, Lepome pale. (p. 30.)

**MICROPTERUS PALLIDUS** (Raf.) Gill & Jordan.

(Young; "length 6 to 12 inches".)

= *Micropterus nigricans* (C. & V.) Gill.

= *M. floridanus* (Le S.) Goode.

13th species, Streaked-Cheeks, River-Bass, **LEPOMIS TRIFASCIATA**, Lepome trifasciæ. (p. 31.)

**MICROPTERUS SALMOIDES** (Lac.) Gill. ("Over a foot in length".)

14th species, Brown River-Bass, **LEPOMIS FLEXUOLARIS**, Lepome flexueux. (p. 31.)

**MICROPTERUS SALMOIDES**. (Adult; "reaching the length of 2 feet".)

This is made to form another subgenus, *Nemocampsis*.

2d Subgenus, **DIOPLITES**. (p. 32.)

15th species, Trout River-Bass, **LEPOMIS SALMONEA**, Lepome saumone. (p. 32.)

**MICROPTERUS SALMOIDES**. ("Length 6 to 24 inches".)

16th species, Spotted River-Bass, **LEPOMIS NOTATA**, Lepome tache. (p. 32.)

**MICROPTERUS SALMOIDES**. ("3 to 8 inches long".)

17th species, Sunfish River-Bass, **LEPOMIS ICTHELOIDES**, Lepome ictheloide. (p. 32.)

*Ambloplites ichtheloides* Ag.

**AMBLOPLITES RUPESTRIS** (Raf.) Gill.

This is made to "almost form a peculiar subgenus", termed *Ambloplites*.

**VI. Genus, POMOXIS, POMOXIS, Pomoxe**. (p. 33.)

= *Pomoxis* Agassiz.

18th species, Gold-Ring Pomoxis, **POMOXIS ANNULARIS**, Pomoxe annulaire. (p. 33.)

**POMOXYS ANNULARIS** Raf.

*Cichla storeria* Kirtland.

*Pomoxys storerius*, *intermedius*, *protacanthus*, and *brevicauda* Gill.

Description not entirely accurate, but certainly sufficient for identification. This fish is now, as in Rafinesque's time, abundant at the Falls of the Ohio, where it is now called "Bachelor". Throughout Kentucky it is known as the "New Light", and sometimes as "Campbellite". The characters assumed to distinguish *intermedius*, *protacanthus*, etc., are entirely within the bounds of individual variation.

## VII. Genus, RED-EYE, APLOCENTRUS, Aplocentre. (p. 31.)

19th species, Ohio Red-Eye, APLOCENTRUS CALLIOPS, Aplocentre belœil. (p. 31.)

A myth, described from a drawing by Mr. Audubon. Its characters would indicate a sort of Sunfish with a dorsal fin resembling that of *Coryphæna*, "beginning behind the head with a single long, spiny ray, and ending close to the tail".

The name "Red-Eye" in the region which this fish is supposed to inhabit is chiefly applied to the Rock-Bass (*Ambloplites rupestris*).

## VIII. Genus, BARBOT, POGOSTOMA, Barbotte. (p. 34.)

20th species, White-Eyes Barbot, POGOSTOMA LEUCOPS, Barbotte œuilblanc. (p. 35.)

Another mythical species, "described from a drawing of Mr. Audubon" It is a toothless Sunfish, with two small distant dorsal fins, and six barbels about the mouth. Whatever it is, it has probably no longer "a great many vulgar names, such as White-Eyes, Spectacles-Fish, Streaked Sunfish, Black Sunfish, Barbot, Bearded Sunfish, etc.". Nor do the French settlers call it "Barbotte, Poisson Lunette, and Œuil-Blanc". There is no sort of foundation for Professor Agassiz's assertion that "*Pogostoma* is evidently synonymous with *Lota*".

## IX. Genus, HOGFISH, ETHEOSTOMA, Etheostome. (p. 35.)

= *Pegedictis* Raf., 1820.

= *Catonotus* Ag., 1854.

= *Etheostoma* Gill. & Jordan emend., 1877.

## 1st subgenus, APLESION. (p. 36.)

= MICROPTERUS Lacépède.

21st species, Bass Hogfish, ETHEOSTOMA CALLIURA, Etheostome calliure. (p. 36.)

MICROPTERUS SALMOIDES. (Young, 3 to 9 inches long.)

"It has some similarity with the *Lepomis flexuolaris*, and some other River-Bass".—(Raf.)

22nd species, Fantail Hogfish, ETHEOSTOMA FLABELLATA, Etheostome eventail. (p. 36.)

## ETHEOSTOMA FLABELLARIS Raf.

*Etheostoma flabellaris* Raf., 1819.

*Catonotus flabellatus* Auct.

Description fair. The genus *Etheostoma* was based originally on this

species, *E. blennioides*, and *E. caprodes*. The original diagnosis was drawn from *E. flabellaris*, and the subsequent subtraction of the two latter as *Diplesium* leaves the name properly to be retained here.

\*23d species, Black Hogfish, **ETHEOSTOMA NIGRA**, *Etheostome noire*. (p. 37.)

**BOLEOSOMA NIGRA** (Raf.) Jordan.

*Boleosoma maculatum* Agassiz.

*Boleosoma brevipinne* Cope.

Not *Nothonotus maculatus* Agassiz.

Not *Pæcilihthys camurus* Cope.

Description not very good, but I have little hesitation in making the above identification, as the colors of the males of this species in spring are often so intense in life as to give the impression of a truly black fish. The small, dark spots, obvious on close inspection, may be readily overlooked.

The name *Aplesium* cannot be retained for this genus, as in the number of the Western Miscellaneous Mag. in which *Aplesion* was first proposed this species was not included.

I am now convinced that my previous identification of *Etheostoma nigra* with *Pæcilihthys camurus* Cope and *Etheostoma maculatum* Kirt. is erroneous.

†2d subgenus, **DIPLESION**. (p. 37.)

†24th species, Blunt-Nose Hogfish, **ETHEOSTOMA BLENNIOIDES**, *Etheostome blennioide*. (p. 37.)

**DIPLESIUM BLENNIOIDES** Raf.

*Etheostoma blennioides* Kirtland (description but not figure), (not of Agassiz and late authors).

*Pileoma cymatogramma* Abbott.

*Hystoma cymatogrammum* Cope.

Rafinesque's description cannot refer to the "*E. blennioides* Raf." of Agassiz and recent authors (= *Alvordius aspro* Cope and Jor.). The

\* Entirely black, pale beneath; scales smooth, lateral line straight, mouth rather beneath, forehead rounded, upper jaw longer; preopercule rounded, spine acute; vent rather anterior; tail entire nearly truncate.

From one to two inches long. Observed in Green River. Vulgar name Black Minny. Iris black, silvery, and small. Diameter one-seventh of the length, without spots. Head small. Pectoral fins oboval. Tail 20. Anal fin 2 and 8. Dorsal 10 and 12.

† Dorsal fin nearly double, divided into two joining parts. Meaning nearly double.

‡ Body elongate, breadth one-eighth of the length, olivaceous, almost diaphanous, some brown spots on the back, and some brown geminate transversal lines across the lateral line,

beautiful and singular coloration of that species—a chain of rounded, confluent, black blotches on a yellowish ground—would surely have been noticed. Moreover, the pattern of color of Rafinesque's fish is exactly that of a young "*Hyostoma cymatogrammum*". Furthermore, the characters "head small", "snout rounded", "mouth small, beneath", "cheeks swelled", "dorsal 13 and 13", "a brown stripe upon it", etc., apply perfectly to the "*Hyostoma*" and not to the "*Etheostoma*". In the streams where Rafinesque collected, I find the former species much the more abundant.

25th species, Common Hogfish, **ETHEOSTOMA CAPRODES**, *Etheostome capros*. (p. 38.)

**PERCINA CAPRODES** (Raf.) Girard.

Description good.

X. Genus, **GOLDSHAD, POMOLOBUS**, *Pcmolobe*. (p. 38.)

< *Alosa* of authors.

= *Pomolobus* Gill.

26th species, Ohio Goldshad, **POMOLOBUS CHRYSOCHLORIS**, *Pomolobe dore*. (p. 39.)

**POMOLOBUS CHRYSOCHLORIS** Raf., Gill., and late authors.

Description good.

XI. Genus, **GIZZARD, DOROSOMA**, *Dorosoma*. (p. 39.)

= *Chatoëssus* Cuvier and most authors.

= *Dorosoma* Gill.

27th species, Spotted Gizzard, **DOROSOMA NOTATA**, *Dorosoma tache*. (p. 40.)

**DORYSOMA HETERURA** (Raf.) Jor.

*Clupea heterurus* Raf., 1818.

*Chatoëssus ellipticus* Kirtland.

Good description of a young specimen.

which is straight, but raised at the base. *Head small, snout rounded, mouth small beneath, lower jaw shorter*; opercle angular, spine acute; scales ciliated, pectoral fins elongate, tail also, and bilobed at the end.

A strange species, which has the appearance, head and spots of many Blennies. Length 2 or 3 inches, and slender. Seen in the Ohio, Wabash, Muskingum, &c. Color *pale, sometimes fulvous, whitish beneath. Checks swelled* and smooth, preopercule simple arched, opercle quite angular; iris large and blackish; scales roughened by the ciliation. *Dorsal fin 13 and 13*, beginning above the middle of the pectorals and ending with the anal, *one faint, longitudinal brown stripe on it*. Tail 20 rays, with many small transversal lines. Vent medial. Anal fin 2 and 8. Pectoral fins 16, oblong acute.



\* XII. Genus, GOLD HERRING, NOTEMIGONUS, Notemigone. (p. 40.)

< *Abramis* Cuvier and many authors (not type).

= *Stilbe* Dekay (pre-occupied in botany).

= *Stilbius* Gill.

= *Luxilus* Girard (not of Rafinesque = *Hypsilepis*).

= *Leucosomus* Storer (not of Heckel).

= *Plargyrus* Putnam (not of Rafinesque, etc.).

† 28th species, Ohio Gold Herring, NOTEMIGONUS AURATUS, Notemigone dore. (p. 40.)

NOTEMIGONUS AMERICANUS (L.) Jordan.

*Cyprinus americanus* Linnæus.

*Stilbe chrysoleuca* (Mit.) Dek.

*Stilbe americana* (L.) Cope.

*Abramis americanus* (L.) Günther.

A very good description, correct in every particular. This fish is rarely or never called Shiner in the Ohio Basin, and it is very often considered by the fisherman as a Shad. If this genus be really distinct from the European *Abramis*, as its serrated teeth indicate, the generic name of *Notemigonus* must be adopted.

XIII. Genus, FALSE HERRING, HYODON, Hyodon. (p. 41.)

1st subgenus, AMPHIODON. (p. 41.)

29th species, Toothed False Herring, HYODON AMPHIODON, Do. (sic.) (p. 42.)

HYODON TERGISUS Le Sueur.

It is now generally conceded that there is but one species of *Hyodon*. I find some variation in form of body and number of fin-rays in specimens from different waters, but nothing indicating specific distinction. No author, so far as I know, has paid any attention to the numerous

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\* Body fusiform, compressed, scaly. Vent posterior. Abdomen *obtusely carinated, not serrate*; back similar before the dorsal fin. Head scaleless, mouth small, without teeth, lower jaw longer; gill-cover double, opercule simple. Abdominal fins with nine rays and no lateral appendage. Dorsal fin behind them above the vent. This genus differs from *Clupea* by the carinated back and belly, without serratures, and the posterior dorsal. The name means back half angular. 14th G. of my Prodr. N. G. Animals.

† Back gill olivaceous, remainder gill silvery; fins yellow; lateral line following the curve of the belly; dorsal with 9 rays, anal with 12; tail equally forked.

Length from 4 to 8 inches, diameter one-fifth of the total length. Iris gilt. Tongue short, toothless. Scales large, radiating with nerves. Head convex above and small. Dorsal fin broad trapezoidal, the first ray longer. Anal broad also, but not so much. Pectoral small with 16 rays. Tail 24. Not uncommon in the Ohio, Kentucky, Miami, &c. The vulgar names are Gold Herring and Yellow Herring. It appears in the fall. It does not bite at the hook. Flesh pretty good.

species of Rafinesque.\* The name *Glossodon* was published by Rafinesque for this genus in September, 1818, within a few days of the publication of *Hiodon* by Le Sueur. It is not known which has priority, but as Le Sueur's paper was first *written*, and as his name has come into common use, it is probably best to retain it.

30th species, Summer False Herring, **HYODON HETERURUS**, *Hyodon heterure*. (p. 42.)

2d subgenus, **GLOSSODON**. (p. 42.)

31st species, Summer False Herring, **HYODON VERNALIS**, *Hyodon printanier*. (p. 43.)

3d subgenus, **CLODALUS**. (p. 43.)

32d species, May False Herring, **HYODON CLODALUS**, *Hyodon de May*. (p. 43.)

33d species, Lake False Herring, **HYODON TERGISUS**, *Hyodon lacustre*. (p. 43.)

**XIV. Genus, TROUT SALMO, Truite.** (p. 44.)

34th species, Alleghany Trout, **SALMO ALLEGANIENSIS**, *Truite alle-ganienne*. (p. 44.)

**SALMO FONTINALIS** Mitchill.

35th species, Black Trout, **SALMO NIGRESCENS**, *Truite noiratre*. (p. 45.)

**SALMO FONTINALIS** Mitchill.

\* **XV. Genus, MINNY, MINNILUS, Minny.** (p. 45.)

\* Body elongated, somewhat compressed, covered with small scales. Vent medial Head flat above, and somewhat shielded. Gill-cover double, scaleless, three branchial rays. Mouth diagonal, small, toothless and beardless, without lips, lower jaw shorter and narrower. A small trapezoidal dorsal fin, nearer to the head than to the tail, opposite to the abdominal fins, and without spines. Abdominal fins with eight rays, and without appendages. (Tail forked in all the Ohio species.)

There are in the United States more than fifty species of small fresh-water fishes (and in the Ohio waters more than sixteen species), commonly called Minnies, Minnows, Bait-fish, Chubs, and Shiners, which should belong to the genus *Cyprinus* of Linnæus, or, rather, to the part of it which has been called *Leuciscus* by Klein and Cuvier; which subgenus (or genus) is distinguished by a small dorsal fin, no spines nor beards; but as the genus *Cyprinus* forms now a large family, and even the genus *Leuciscus* must be divided, since it contains more than one hundred anomalous species, differing in the position of the dorsal fin and the vent, the number of rays to the abdominal fins, &c., I venture to propose this and the three following genera. Three other different genera might be established upon the European species, distinguished as follows:

*Dobula*. Dorsal fin nearer to the tail, abdominal fins with nine rays and an appendage; upper jaw longer.

*Phoxinus* differs by ten abdominal rays and no appendage.

*Alburnus* differs from *Dobula* by no appendage and the lower jaw longer.

Besides my genus *Hemiplus* (*Annals of Nature*), which has the vent posterior, the lower jaw longer, only five rays and an appendage to the abdominal fins.

All these small fish are permanent; they feed on worms, insects, univalve shells, and spawn; they bite at a small hook, baited with worms or flies, and they form an excellent bait for all the larger fish which feed upon them. They are good to eat when fried.

\* 36th species, Slender Minny, *MINNILUS DINEMUS*, Minny emeraude. (p. 46.)

*NOTOTROPIS DINEMUS* (Raf.) Jordan.

*Alburnellus jaculus* Cope.

The coloration and form are those of *Alburnellus jaculus*, with which I have identified this description.

† 37th species, Spotted Minny, *MINNILUS NOTATUS*, Minny tache. (p. 47.)

*HYBORHYNCHUS NOTATUS* (Raf.) Ag.

*Hyborhynchus notatus* Agassiz.

*Hyborhynchus superciliosus* Cope.

Agassiz's identification of his *Hyborhynchus* with this species is possibly correct, although the description is very irrelevant. The common *Hyborhynchus* of the Ohio region has small but distinct barbels at the angle of the mouth, and is therefore *H. superciliosus* of Cope. The latter name is probably a synonym of *H. notatus*.

‡ 38th species, Little-Mouthed Minny, *MINNILUS MICROSTOMUS*, Minny microstome. (p. 47.)

*HYBOPSIS MICROSTOMUS* (Raf.) Jordan.

*Hybopsis longiceps* Cope.

*Hybopsis microstomus* (Raf.) Jordan.

This description agrees very closely with specimens sent me by W. M.

\* Diameter one-eighth of total length, silvery, back olivaceous with a brown longitudinal stripe in the middle; two lateral lines, one straight, the lower curved downwards and shorter; head gill and green above. Dorsal fin 9 rays. Anal fin 12 rays.

A small and slender species, common in the Ohio, &c., and going in flocks; length 2 or 3 inches. Its head is beautiful when alive; it is above of a fine gold color with green shades, becoming of an emerald-green above the eyes. Iris silvery; sides opaque, upper lateral line gold-green. Nostrils large. Pectoral fins with 12 rays, not reaching the abdominal. All the fins silvery. Tail with 24 rays. Scales very small.

† Diameter one-seventh of total length, silvery, back olivaceous with a large brown stripe in the middle; head brown above, lateral line straight, a black spot at the base of the tail. Dorsal with 8, and anal with 9 rays.

Same size with the preceding, but not so slender, and less common. Iris golden, nostrils very large, mouth small, lateral line shining blue on the opaque sides. Pectoral fins with 12 rays, and not reaching the abdomen. Tail with 14 rays. It is often called Minny Chub.

‡ Diameter one-seventh of total length; silvery, olivaceous on the back and head, sides with a few black dots, lateral line straight, pectoral fins reaching the abdominal fins. Dorsal and anal fins with eight rays.

A small species found in the Kentucky River. Mouth very small, nostrils large, iris silvery, fins fulvous, the pectoral with 12 and the caudal with 24 rays. Head elongated.

Linney from Salt River, Kentucky. An examination of Professor Cope's types of *Hybopsis longiceps* has convinced me of the identity of that species with Rafinesque's. It is perhaps best to unite *Hybopsis* with *Luxilus*. The distinctive character of the high scales, so noticeable in *L. cornutus*, fades by insensible degrees into the ordinary *Hybopsis* type.

Under *Luxilus* the following subgeneric sections are probably conveniently recognizable:

- a. *Luxilus*: type *cornutus*.
- b. *Alburnops*: type *blennius*.
- c. *Hybopsis*: type *gracilis*.
- d. *Hudsonius*: type *hudsonius*.

\* XVI. Genus, SHINER, *Luxilus*, Luxile. (p. 47.)

*Hypsilepis* Baird, 1854.

*Hybopsis* Ag., 1854.

*Alburnops* and *Hudsonius* Grd., 1856.

*Luxilus* Jordan, 1876.

1st subgenus, CHROSOMUS. (p. 47.)

39th species, Red-Belly Shiner, LUXILUS ERYTHROGASTER, Luxile erythrogastræ. (p. 47.)

CHROSOMUS ERYTHROGASTER Raf.

Description characteristic, although slightly erroneous. The coloration described is that of *C. oreas* Cope, rather than that of the *erythrogastræ* of Agassiz.

†2d subgenus, LUXILUS. (p. 48.)

= *Plargyrus* Girard (*nec* Rafinesque).

= *Hypsilepis* Baird and most authors.

= *Luxilus* m.

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\* Difference from *Minnilus*: Vent posterior or nearer to the tail. Mouth rather large, commonly with lips and equal jaws. Scales rather large. Preopercule with an angular suture.

†Mouth rather large, with small flat lips, jaws equal, scales large.

\* 40th species, Gold-Head Shiner, **LUXILUS CHRYSOCEPHALUS**, *Luxile chrysocephale*. (p. 48.)

† **LUXILUS CORNUTUS** (Mitch.) Jor.

*Cyprinus cornutus* Mitchill.

*Hypsilepis cornutus* (Mitch.) Storer and authors.

*Plargyrus typicus, cornutus, frontalis*, etc., Girard.

Description fair, excepting that the pectorals scarcely reach the ventrals, and older specimens are less elongated. The *cornutus* is very abundant throughout the Ohio Valley, where it is everywhere known as the *Shiner*, a name rarely applied to any other fish. Rafinesque's description is very correct as regards its average appearance in the West when not tuberculate or flushed with red. His account has, however, been carelessly referred to *Cyprinus chrysoleucus* of Mitchill, solely on account of the similarity of the names, although Rafinesque correctly indicates the chief points of difference. As *chrysocephalus* is evidently intended as the type of *Luxilus*, the latter is synonymous with *Hypsilepis*, and we have no alternative but to restore the older name in place of the latter and more scientific appellation.

‡ 41st species, Kentuckian Shiner, **LUXILUS KENTUCKIENSIS**, *Luxile du Kentucky*. (p. 48.)

?? **LUXILUS CORNUTUS** (Mit.) Jor.

Not *Luxilus kentuckiensis* Kirtland.

This species is not yet satisfactorily identified. It is certainly not

\* Diameter one-fifth of total length, *silvery* with golden shades on the sides, *head gilt, back and nape dark olivaceous; lateral line curved downwards*, pectoral fins reaching the abdominal. *Dorsal and anal fins with nine rays*.

Vulgar names, Gold Chub, *Shiner*, Goldhead, &c. Length 6 inches. It is found in Kentucky, Ohio, Cumberland, Green River, &c. *Iris golden. Fins fulvous*, the pectoral golden, large, with 14 rays; tail with 24. *It resembles the common Shiner or Butterfish* of Pennsylvania, *Cyprinus chrysoleucos* Mitchill, but that fish is a *Rutilus*, having nine abdominal rays; its body is besides shorter and the anal fin is *falcated with 15 rays*.

† Additional evidence of the correctness of this identification is found in a MSS. paper on the Fishes of Pennsylvania, by Rafinesque, now in the possession of Professor Baird. In this paper the species in question is described under the name of *Luxilus cornutus* (Mit.) Raf.

‡ Diameter one-seventh of total length, *silvery*, back *olivaceous*, lateral line curved downwards, *dorsal and caudal fins red*, the pectoral yellow, not reaching the abdomen. *Dorsal 8 and anal 7 rays*.

Vulgar names: Indian Chub, Red-tail, Shiner, &c. Length about 4 inches. It is reckoned an excellent bait for anglers, because it will swim a long while with the hook in its body. Eyes small, iris brown with a gold ring. Yellowish-brown above the head. Abdominal and anal fins white. Pectoral and abdominal fins oboval, with 12 rays. Tail with 24 rays.

the Silver-Fin, *Luxilus kentuckiensis* Kirtland, as has been shown by Professor Cope.

\* 42d species, Yellow Shiner, **LUXILUS INTERRUPTUS**, *Luxile jaunatre*. (p. 49.)

Not identified.

The description contains little that is suggestive, and it might apply to almost any of the small silvery species.

**XVII. Genus, CHUBBY, SEMOTILUS, Semotile.** (p. 49.)

= *Semotilus* Raf.

43d species, Bigback Chubby, **SEMOTILUS DORSALIS**, *Semotile dorsal* (p. 49.)

**SEMOTILUS CORPORALIS** (Mitchill) Putnam.

44th species, Bighead Chubby, **SEMOTILUS CEPHALUS**, *Semotile cephal.* (p. 49.)

**SEMOTILUS CORPORALIS** (Mitchill) Putnam.

†45th species, Warty Chubby, **SEMOTILUS DIPLEMIUS**, *Semotile ver-rueux.* (p. 50.)

**LYTHRURUS DIPLÆMIUS** (Raf.) Jor.

Not *Leuciscus diplæmius* Kirtland (= ? *Lux. cornutus* var.).

*Hypsilepis diplæmia* Cope.

This can hardly be the *Lythrurus diplæmius*, as that species has a long anal fin, and the male fish has, instead of "some black warts on the head", the whole upper surface of the head and neck studded with minute whitish tubercles. Moreover, the dorsal spot is not "round", and there is no caudal spot. Still, as I can at present suggest no better identification, I allow that made by Professor Cope to stand.

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\* Diameter one-sixth of total length; yellowish-olivaceous above, silvery beneath, rufous brown above the head, a rufous line from the dorsal to the tail, two straight and separated half lateral lines, the anterior one above the posterior; pectoral fins reaching the abdominal. Dorsal with 10 and anal with 9 rays.

A small species, only 3 inches long, called Yellow Chub or Shiner. Seen in the Ohio. Sides opaque, with violet shades. Iris silvery, mouth large, lips very apparent. Fins yellowish, pectorals with 16 rays, caudals with 24.

† Diameter one-sixth of total length; olivaceous brown with gold shades above, silvery beneath; lateral line double, the anterior and lower curved upwards at the base, reaching to the abdominal fins, the posterior and upper straight from the pectoral fins to the tail; fins red, a spot at the base of the dorsal and caudal, and many dots over them. Dorsals with nine rays; the anal with eight.

Length from 3 to 4 inches, often called Minny or Red-Fin. Observed in the Kentucky River near Estill. The male fish has a larger mouth than the female and some black warts on the head. Fulvous brown on the head. Iris large, golden and white. Some black dots on the dorsal and caudal fins; the caudal spot is on tail and the dorsal at the anterior base; they are small and round. The pectoral fins do not reach the abdominal fins; they have 18 rays; the tail has 24.

\* XVIII. Genus, FALLFISH, *Rutilus*, *Rutile*. (p. 50)= *LEUCISCUS* Klein.

† 46th species, Silverside Fallfish, *RUTILUS PLARGYRUS*, *Rutile plargyre*. (p. 50.)

*LUXILUS CORNUTUS* (probably).

Rafinesque's account applies about equally well to *Luxilus cornutus* and *Cyprinella analostana* Grd. I prefer to follow Dr. Kirtland and writers generally in identifying it with the preceding species. The name *Plargyrus* is not available for any of our genera of *Cyprinidæ*. As *Cyprinus rutilus* L. is stated to be the type of *Rutilus* Raf., it is the type of that genus, and the provisional name *Plargyrus* is unnecessary.

‡ 47th species, Baiting Fallfish, *RUTILUS COMPRESSUS*, *Rutile appat*. (p. 51.)

Not yet satisfactorily identified. It is probably not *Leuciscus compressus* of Kirtland. It may have been based in part on *Nototropis rubrifrons* (Cope.)

§ 48th species, Round-Nose Fallfish, *RUTILUS AMBLOPS*, *Rutile amblopse* (p. 51.)

*NOCOMIS AMBLOPS* (Raf.) Cope & Jordan.

*Ceratichthys hyalinus* Jordan, Man. Vert. (not of Cope).

Description rather indefinite. As Girard has identified it with a species of *Ceratichthys*, I refer it to a member of that genus common at the

\* Difference from *Minnilus*: Vent posterior, nearer to the tail. Abdominal fins with nine rays. Mouth large and with lips. Scales large.

I call this genus *Rutilus*, in the supposition that the *Cyprinus rutilus* may be the type of it; if it should be otherwise, it may be called *Plargyrus*.

† Diameter one-fifth of total length; silvery, back with the dorsal, pectoral, and caudal fins olivaceous; lateral line curved downwards; snout truncate; mouth almost vertical. Dorsal and anal fins with 9 rays.

Length from 4 to 6 inches; vulgar names:—Silverside, Shiner, White Chub, &c. Common in the streams of Kentucky. Mouth large, upper jaw almost vertical, yet longer than the lower. Iris white. Pectoral fins with 14 rays, reaching almost the abdominals, which are oboval and white. Tail forked as usual with 24 rays. Scales large.

‡ Diameter one-seventh of total length; silvery, back fulvous, sides compressed, lateral line straight, raised upwards at the base, snout rounded, mouth hardly diagonal, nearly horizontal. Dorsal and anal fins with 9 rays.

A small fish from 2 to 4 inches long, called Fall-fish, Bait-fish, Minny, &c. It is found in the Alleghany Mountains, in the waters of the Monongahela, Kenhaway, and even in the Potomac. The name of Fall-fish arises from its being often found near falls and ripples. Body more compressed than in the other species; as much so as in the genus *Minnilus*. Scales large; lips a little fleshy; iris silvery-gilt; fins transparent; the pectoral with 14 rays, and not reaching the abdominal; tail with 32 rays.

§ Diameter one-sixth of total length; silvery, head fulvous above, snout round;

Falls of the Ohio, which, if distinct from *C. hyalinus* Cope, as Professor Cope thinks, seems not to have received any other name.

49th species, Black-tail Fallfish, **RUTILUS MELANURUS**, Rutilé melanure. (p. 51.)

**MYXOSTOMA DUQUESNII** (Le S.) Jor. (young).

Description incorrect and insufficient. The "15 dorsal rays" indicates a Sucker, and the coloration is that of a young "Red-Horse".

\* 50th species, Anomal Fallfish, **RUTILUS ANOMALUS**, Rutilé anomal. (p. 52.)

? **CAMPOSTOMA ANOMALUM** (Raf.) Ag.

This description is perhaps intended for *Campostoma*, but it is very imperfect, if not erroneous.

† 51st species, Red Minny, **RUTILUS ? RUBER**, Rutilé rouge. (p. 52.)

**LYTHRURUS** species.

Probably the male fish of one of the species of *Lythrurus* is intended rather than a *Chrosomus*, as supposed by Professor Agassiz. *Lythrurus ardens* is abundant in the upper waters of the Cumberland: Few fishes in our waters are of so "fine a purple red".

**XIX. Genus, FAT-HEAD, PIMEPHALES, Pimephale.** (p. 52.)

52d species, Blackheaded Fat-head, **PIMEPHALES PROMELAS**, Pimephale tete-noire. (p. 53.)

**PIMEPHALES PROMELAS** Raf.

Description fair. This species is very abundant in small streams about the Falls of the Ohio.

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sides with an opaque band, lateral line straight; pectoral fins with 12 rays, and reaching the abdominal fins. Dorsal and anal fins with 10 rays.

Length 1 or 2 inches. Vulgar name: White Chub, or Fall-fish. It is found at the falls of the Ohio. Back slightly fulvescent, snout large and rounded, mouth hardly diagonal, eyes large, iris silvery, and scales large. Tail with 30 rays.

\* Diameter one-fifth of total length, fulvous above, sides dusky, white beneath, snout rounded, a vertical brown line behind the gills; lateral line straight, raised upwards at the base; pectoral fins yellow, oboval, short, with 15 rays; tail unequally bilobed, the upper lobe larger. Dorsal and anal fins red; dorsal 8 and anal 7 rays.

An anomalous fish, differing from all those of the Cyprinian tribe in the Ohio, by its unequal bilobed tail, which is brownish, and has 22 rays. Mouth diagonal. Eyes small; iris olivaceous gilt. Nape of the neck red, scales rather small. Length 3 inches. Found in Licking River, &c. Vulgar names: Chub, Redfish, Fallfish, &c.

† Entirely red; tail forked.

I add here a fine small fish, which I have never seen as yet, but it is said to live in the small streams which fall into the Elkhorn and Kentucky. It is a slender fish, only 2 inches long, compressed, and of a fine purple red. It may belong to this genus, or to any other of this tribe. It is commonly called Red-minny.



## XX. Genus, SUCKER, CATOSTOMUS, Catostome. (p. 53.)

" 1st subgenus, MOXOSTOMA. (p. 54.)

*Myxostoma* Jor.(Not *Moxostoma* of Agassiz and authors = *Erimyzon m.*)

† 53d species, Ohio Carp-Sucker, CATOSTOMUS ANISURUS, Catostome anisure. (p. 54.)

MYXOSTOMA ANISURA (Raf.) Jordan.

(Not *Moxostoma anisurus* Agassiz = *Erimyzon oblongus* (Mit.) Jordan.)*Catostomus anisurus* Kirtland.*Ptychostomus collapsus* Cope.

This species, described by Rafinesque, and described and figured by Dr. Kirtland, is said to possess a lateral line, and to have red fins. Furthermore, it is known as "Carp", and reaches a length of 1 to 3 feet. It is evidently not a *Moxostoma* as that genus is defined by Agassiz, but a *Ptychostomus*. *Moxostoma* becomes, therefore, a synonym of *Ptychostomus*, and having priority must supersede it. In accordance with the etymology of the word, I have changed the first vowel *o* to *y*.

54th species, Buffalo Carp-Sucker, CATOSTOMUS ANISOPTERUS, Catostome anisopture. (p. 54.)

? *Carpiodes velifer* (Raf.) Ag.

An insufficient description of some *Carpiodes* "from a drawing by Mr. Audubon". Rafinesque remarks: "The *C. tuberculatus* of Le Sueur belongs also to this subgenus, having 8 abdominal rays, but its tail is regularly bifid".

2d subgenus, ICTIOBUS. (p. 55.)

= *Ichthyobus* Agassiz."The *C. gibbosus* and *C. communis* of Le Sueur appear to be intermedi-

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\* Body oblong, compressed; head compressed, eight abdominal rays, dorsal fin commonly longitudinal; tail commonly unequally forked.

† Diameter one-fifth of the length; silvery, slightly fulvescent above, fins red, the dorsal olivaceous, falcated with 17 rays, nearer to the head and reaching the vent; lateral line curved upwards and flexuose at the base; snout gibbose; tail forked, upper part longer. Anal fin falcate with 8 rays.

A large species common all over the Ohio and the largest streams, as far as Pittsburgh. Permanent and sometimes taken in winter. It is called Carp everywhere. Length from one to three feet. It is taken with the hook, seine and dart. Its flesh is pretty good, but soft. The male fish has a red tail; while it is olivaceous in the female. Snout divided from the head by a transverse hollow which makes it gibbose. Eyes black, iris silvery and golden above. Sides often with copper shades. Scales large with concentric stria. Pectoral fins large, oval acute, with 15 rays, and reaching the abdominal fins. Caudal with 24 rays.

ate between this subgenus and the foregoing, having 9 abdominal rays, but an unequally bilobed tail.”—(Raf.)

55th species, Brown Buffalo-Fish, **CATOSTOMUS BUBALUS**, *Catostome bubale*. (p. 55.)

**ICHTHYOBUS BUBALUS** (Raf.) Ag.

Description passable.

\* 56th species, Black Buffalo-Fish, **CATOSTOMUS NIGER**, *Catostome noir*. (p. 56.)

‡ **BUBALICHTHYS NIGER** (Raf.) Ag.

Description insufficient.

3d subgenus, **CARPIODES**. (p. 56.)

*Carpiodes* Agassiz and authors.

“The *C. cyprinus* and *C. setosus* of Le Sueur belong to this subgenus.”—(Raf.)

† 57th species, Olive Carp-Sucker, **CATOSTOMUS CARPIO**, *Catostome carpe*. (p. 56.)

**CARPIODES CARPIO** Raf.

*Carpiodes nummifer* Cope.

This description apparently refers to the species lately called *C. nummifer* by Professor Cope. I therefore adopt Rafinesque’s specific name.

58th species, Sailing-Sucker, **CATOSTOMUS VELIFER**, *Catostome volant*. (p. 56.)

**CARPIODES VELIFER** (Raf.) Ag.

A fair description.

‡ 59th species, Mud-Sucker, **CATOSTOMUS XANTHOPUS**, *Catostome xanthope*. (p. 57.)

**HYPENTELIUM NIGRICANS** (Le S.) Jor.

It is possible that this description was intended for the *Cat. nigricans* Le S., but the latter is certainly not a “mud-fish”, as Professor Agassiz

\* Entirely black, lateral line straight.

I have not seen this fish. Mr. Audubon describes it as a peculiar species, found in the Mississippi and the lower part of the Ohio, being entirely similar to the common Buffalo-fish, but larger, weighing sometimes upwards of 50 pounds, and living in separate shoals.

† Diameter one-fourth of the length; olivaceous above, pale beneath, chin white, abdomen bluish; lateral line straight, dorsal fin somewhat falcated with 36 rays, and trapezoidal with 10 rays; head sloping, snout rounded.

Seen at the falls of the Ohio; commonly called Carp. Length from one to two feet. Eyes very small and black; fins olivaceous brown, the pectorals olivaceous, trapezoidal, short, and with 16 rays. Tail with 24. Dorsal fin beginning before the abdominal and reaching the end of the anal fin. Not so good to eat as the Buffalo-fish.

‡ Diameter one-fourth of the length; lateral line straight; silvery, back olivaceous,

seemed to suppose. Of all the Suckers, it is the most readily affected by impure water, and it is usually to be found only in clear, running streams.

\* 4th subgenus **TERETULUS**. (p. 57.)

Of the species assigned to this subgenus, three belong apparently to *Myxostoma*, three to *Catostomus* proper, two to *Hypentelium*, five to *Erimyzon*, one is a *Cyprinoid*, and the last a myth.

As the name *Teretulus* has been restricted to the genus typified by *Catostomus aureolus* Le S., it is best to consider it as a synonym of *Myxostoma*.

† 60th species, Black-face Sucker, **CATOSTOMUS MELANOPS**, *Catostome melanopse*. (p. 57.)

**ERIMYZON SUCETTA** (Lac.) Jor.

? *Cyprinus sucetta* Lac.

*Catostomus melanops* Kirtland.

*Ptychostomus melanops* Agassiz and authors.

*Erimyzon melanops* (Raf.) Jordan.

Description poor but unmistakable. This fish has the air-bladder in two parts, and the lateral line is obsolete, as stated by Kirtland. It is

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head brown above, snout gibbose rounded; dorsal fin hardly falcate with 14 rays, anal unceoliate with 8 rays; lower fins yellowish.

Found below the falls. Length from 6 to 10 inches. It lives in muddy banks and conceals itself in the mud. Flesh very soft. Head large, flattened above, mouth large, eyes large. Iris silvery. Lateral line hardly raised at the base. Dorsal fin above the abdominal, fins olivaceous as well as the tail, which has 20 rays. Pectorals with 18 rays. Scales large.

\* Body elongate cylindrical or somewhat quadrangular, 9 abdominal rays, dorsal fins commonly small, tail equally forked.

An extensive subgenus, to which belong all the following species of Le Sueur: *C. aureolus*, *C. macrolepidotus*, *C. longirostrum*, *C. nigricans*, *C. vittatus*, *C. maculosus*, *C. sucetta*, besides the *C. teres* and *C. oblongus* of Mitchill.

† Diameter one-seventh of the length; head squared, blackish above, snout convex obtuse; back olivaceous, sides whitish with scattered black dots, a black spot on the gill cover, and a large one between the dorsal and caudal fins; lateral line straight, dorsal fin with 14 rays, anal with 9 rays.

A singular species seen at the falls. It is rare, and called *Spotted Sucker* or *Black Sucker*. Length from 4 to 6 inches; body cylindrical, flattened beneath as far as the vent. Head flat above, blackish there and in the fore part. Mouth almost terminal with thick whitish lips, the lower one shorter and thicker, a few small black spots on the sides of the head, and a large one on the preopercule. Gill cover silvery. Eyes black, iris brown with a gold ring. Back of a rufescent color with gold shades. A very large black patch above the anal fin before the tail. Sides pale with small unequal black dots, belly whitish. Fins coppery, the pectoral elliptical elongated with 18 rays, the anal elongated reaching the tail, the dorsal broad and opposed to the abdominal. Tail with 20 rays. Scales rather large nervose radiated.

therefore an *Erimyzon* and not a "*Ptychostomus*". Both *E. oblongus* and *E. melanops* abound in the lakes as well as in the Ohio. They are much more tenacious of life than the other Suckers. The description of *Cyprinus sucetta* Lacépède (*Catostomus suceti* C. & V.) seems to refer to this species. I therefore have adopted the prior name *sucetta* in preference to that of *melanops*.

The "lateral line" alluded to by Rafinesque here, as in numerous other instances, is merely a lateral streak along the rows of scales, either due to longitudinal furrows or else to peculiarities of coloration.

\* 61st species, Black-back Sucker, **CATOSTOMUS MELANOTUS**, *Catostome melanote*. (p. 58.)

? **CAMPOSTOMA ANOMALUM** (Raf.) Ag.

The "nine dorsal rays" indicates a *Cyprinoid*, and the only species found at the Falls of the Ohio which at all answers this description are the *Nocomis biguttatus* and *Campostoma anomalum*. It is best to identify it with the latter, and thus to avoid a change of names.

† 62d species, Rough-head Sucker, **CATOSTOMUS FACIOLARIS**, *Catostome fascie*. (p. 58.)

**ERIMYZON OBLONGUS** (Mitch.) Jor.

*Moxostoma oblongum* (Mitch.) Ag.

Description indifferent, "from a drawing by Mr. Audubon". The tuberculated snout indicates a spring male of *oblongus*, rather than *nigricans*, to which Professor Agassiz refers Rafinesque's description.

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\* Diameter one-sixth of the length; bluish black above, whitish beneath; head convex, snout obtuse; lateral line straight; dorsal and anal fins with nine rays.

Seen only once at the falls. Length 6 inches, body nearly cylindrical. Mouth rather inferior, lips thick and somewhat gristly. Iris silvery. Scales pretty large. Fins whitish, the dorsal and caudal a little reddish. Pectoral fins elliptical with 16 rays. Tail 20. Dorsal fin trapezoidal, opposed to the abdominal, the first ray shorter. Anal elliptical obtuse. Vulgar names, Black Sucker and Blue Sucker.

† Diameter one-sixth of the length; brown above, white beneath, sides with small transversal black lines; head sloping, tuberculated above, snout obtuse; dorsal fin longitudinal reaching the end of the anal fin, lateral line straight.

I have not seen this species, but describe it from a drawing of Mr. Audubon. It is found in the lower part of the Ohio. Vulgar names: Rough-head Sucker, Pike-Sucker, Striped Sucker. Length about eight inches, body cylindrical tapering behind. Eyes small, mouth beneath. Lower fins trapezoidal, about twenty transversal lines. A doubtful species, perhaps an *Hydrargyrus*, but the mouth is like that of the Sucker.

\* 63d species, Red-tail Sucker, **CATOSTOMUS ERYTHRURUS**, *Catostome rougequeue*. (p. 59.)

**MYXOSTOMA DUQUESNII** (Le S.) Jor.

? *Catostomus duquesnei* Le Sueur.

*Ptychostomus erythrurus* (Raf.) Cope.

*Ptychostomus duquesnei* (Le S.) Ag.

Description not very good. The common "Red-Horse" of the Ohio is certainly Le Sueur's *duquesnei*. Professor Cope recognizes Rafinesque's species as distinct, but I have not yet been able to separate it.

† 64th species, Kentucky Sucker, **CATOSTOMUS FLEXUOSUS**, *Catostome flexueux*. (p. 59.)

**CATOSTOMUS TERES** (Mitch.) Le S.

Description fair. Professor Agassiz is certainly wrong in referring this species to the *Cat. nigricans* of Le Sueur. The description accords better with *Cat. teres*, and the statements with regard to the habits and common name point very strongly to this species, which is still known everywhere in Kentucky as the "Sucker".

‡ 65th species, Big-mouth Sucker, **CATOSTOMUS ? MEGASTOMUS** *Catostome megastome*. (p. 59.)

A myth.

\* Diameter one-fifth of the length: rufous brown above, white beneath: tail olivaceous: head convex, snout rounded: lateral line straight: dorsal fin trapezoidal, reddish with 12 rays: anal fin elongated, yellow, anal falcated, with 7 rays.

A fine species, not uncommon in the Ohio, Kentucky, Cumberland, Tennessee, &c. Vulgar names: Red-horse, Red-tail, Horse-fish, Horse-Suckers, &c. Length about one foot. Scales very large. Mouth beneath. Iris whitish, eyes black. Pectoral fins yellow, elliptical, reaching the abdominals, and with 16 rays. Tail large with 20 rays. Its flesh is dry and not very good to eat.

† Diameter one-fifth of the length; silvery, back brownish, scales rather rough, opercule flexuose; head squared, snout gibbose truncate; lips very thick, the inferior bilobed; lateral line flexuose; tail brown; dorsal fin blackish with 12 rays, anal fin whitish with 7 rays and reaching the tail.

*The most common species, in Kentucky, in all the streams and ponds, called merely Sucker.* Very good to eat. It conceals itself in the mud in winter. It bites at the hook, living on minnies and little lobsters. Body thick cylindrical. From 10 to 12 inches long. Head large, a deep depression between the snout and the head, mouth large with fleshy lips. Eyes large, black, iris yellow. Opercule hard bony. Lower fins whitish, pectorals elongated elliptical with 20 rays. Tail 20 rays. Dorsal trapezoidal, sloping behind. This fish is the most useful to keep in ponds.

‡ Diameter one-fifth of the length; blackish above, yellowish beneath, very broad; a spine at the base of the pectoral fins; lateral line straight.

A very doubtful species seen by Mr. Audubon. It comes sometimes in shoals in March, and soon disappears. Only taken with the seine, not biting at the hook; vulgar name, Brown Sucker. The mouth is very remarkable, being broader than the head, somewhat projecting on the sides; length one foot. The head resembles that of a Cat-fish, but has no barbs. Is it a peculiar genus owing to the mouth and pectoral spine? It might be called *Eurystomus*. The yellow color covers the forehead and reaches to the anal fin. Dorsal opposed to the abdominal and trapezoidal, pectorals elliptical, yellow.

\* 5th subgenus, **DECACTYLUS**. (p. 60.)

66th species, Pittsburgh Sucker, **CATOSTOMUS DUQUESNI**, *Catostome duquesne*. (p. 60.)

**MYXOSTOMA DUQUESNII** (Le S.) Jor.

67th species, Long Sucker, **CATOSTOMUS ELONGATUS**, *Catostome alonge*. (p. 60.)

**CYCLEPTUS ELONGATUS** (Le S.) Ag.

**XXI. Genus, SUCKREL, CYCLEPTUS, Cyclepte**. (p. 61.)

68th species, Black Suckrel, **CYCLEPTUS NIGRESCENS**, *Cyclepte noiratre*. (p. 61.)

**CYCLEPTUS ELONGATUS** (Le S.) Ag.

A very poor description, "on the authority of Mr. Bollman, of Pittsburgh".

† **XXII. Genus, CATFISH, PIMELODUS, Pimelode**. (p. 61.)

Subgenus, **ICTALURUS**. (p. 61.)

1st section, **ELLIOPS**. (p. 62.)

Tail forked. Eyes elliptical. Abdominal fins with less than nine rays.

69th species, Spotted Catfish, **PIMELODUS MACULATUS**, *Pimelode tachete*. (p. 62.)

**ICHTHÆLURUS PUNCTATUS** (Raf.) Jor.

*Silurus punctatus* Raf., 1818.

70th species, Blue Catfish, **PIMELODUS CERULESCENS**, *Pimelode bleuatre*. (p. 63.)

**ICHTHÆLURUS PUNCTATUS** (Raf.) Jor.

\* Body nearly cylindrical, abdominal fins with 10 rays; tail equally forked.

Besides the two following species, the *C. bostoniensis* and *C. hudsonius* must be enumerated here.

† Body scaleless, elongated. Head large, with barbs. Two dorsal fins, the second adipose and separated from the tail, the first short and commonly armed. Pectoral fins commonly armed. Teeth like a file. Vent commonly posterior.

The extensive genus *Silurus* of Linnaeus, which is scattered throughout the rivers of both continents, has not yet been completely illustrated, notwithstanding the labors of the modern ichthyologists. I have found in the Ohio about twelve species belonging to it, most of which offer consimilar character, and appear to belong to the genus *Pimelodus* of Lacépède and Cuvier, which have left the name of *Silurus* to the species having one dorsal fin. I have already published a monography of them in the Journal of the Royal Institution of London, under the generic name of *Silurus*. I now propose to form with them a peculiar subgenus, divided in many sections, and different from the subgenera *Bagrus*, *Synodontus*, *Silusox*, &c.

71st species, White Catfish, *PIMELODUS PALLIDUS*, Pimelode pale. (p. 63.)

*ICHTHÆLURUS PUNCTATUS* (Raf.) Jor.

72d species, Silvery Catfish, *PIMELODUS ARGYRUS*, Pimelode argyre. (p. 64.)

*ICHTHÆLURUS PUNCTATUS* (Raf.) Jor.

2d section, *LEPTOPS*. (p. 64.)

Tail bilobed. Eyes round and small. Nine abdominal rays. Vent posterior. Adipose fin large.

73d species, Clammy Catfish, *PIMELODUS VISCOSUS*, Pimelode visqueux. (p. 64.)

*PELODICHTHYS OLIVARIS* (Raf.) Gill & Jor.

Jaws nearly equal, barbs very short, eyes round, over the head. Body entirely brown, lateral line raised upwards before. Pectoral fins with 1 and 7 rays, anal fin rounded with 15 rays. Tail unequally bilobed and black, upper lobe smaller and white.

75th species, Clouded Catfish, *PIMELODUS NEBULOSUS*, Pimelode nebleux. (p. 64.)

*PELODICHTHYS OLIVARIS* (Raf.) Gill & Jor.

This species is made to form a "peculiar section or even subgenus", termed *Opladelus*.

2d section, *AMEIURUS*. (p. 65.)

Tail entire. Eyes round. Eight abdominal rays. Vent posterior. Dorsal fin anterior with a spine. Lower jaw not longer. Pectoral fins with one simple spine and seven rays.

75th species, Yellow Catfish, *PIMELODUS CUPREUS*, Pimelode cuivre. (p. 65.)

*AMIURUS LIVIDUS CUPREUS* (Raf.) Jor.

\*76th species, Brown Catfish, *PIMELODUS LIVIDUS*, Pimelode livide. (p. 65.)

*AMIURUS LIVIDUS* (Raf.) Jor.

*Amiurus catus* (Grd.) Gill. (Nôt *Silurus catus* L.)

\* Jaws equal, barbs nearly equal together and as long as the head. Eyes round. Body entirely of a livid-brown color. Tail rounded entire. Lateral line raised upwards at the base. Anal fin elongate with 25 rays.

*Silurus lividus*, Monogr. sp. 7.

A small species, entirely of a leaden brown. Head short, slightly olivaceous; throat pale. Barbs equal, the upper ones livid, the lower ones rufous. A furrow on the head which is convex above. Operculum flexuose. Tail with 24 rays. Dorsal with 1 and 7. Spines short.

\* 77th species, Black Catfish, *PIMELODUS MELAS*, Pimelode noir. (p. 66.)

*AMIURUS MELAS* (Raf.) Jordan.

*Amiurus obesus* Gill.

† 78th species, Yellow-Head Catfish, *PIMELODUS XANTHOCEPHALUS*, Pimelode xanthocephale. (p. 66.)

*AMIURUS XANTHOCEPHALUS* (Raf.) Gill.

4th section, *ILICTIS*. (p. 66.)

Tail entire, eyes elliptical. Nine abdominal rays. Dorsal fins sub-medial. Pectoral fins with one flat spine serrated outwards and nine rays. Lower jaw longer.

79th species, Mud-Catfish, *PIMELODUS LIMOSUS*, Pimelode bourbeux. (p. 66.)

*PELODICHTHYS OLIVARIS* (Raf.) Gill & Jor.

‡ **XXIII. Genus, MUDCAT, PELODICTIS, Pylodictis.** (p. 67.)

*PYLODICTIS* Raf., 1819.

*OPLADELUS* Raf., 1820.

*HOPLADELUS* Gill, 1861.

*PELODICHTHYS* Gill & Jordan, 1877.

\* Jaws nearly equal. Eyes round. Barbs unequal, shorter than the head. Body entirely black, lateral line straight. Anal fin with 20 rays. Tail nearly truncate, entire.

*Silurus melas*, Monogr. sp. 8.

A rare species less than a foot long. Hardly pale beneath. Dorsal fin 1 and 7. Found below the falls.

† Upper jaw longer. Barbs unequal, shorter than the head. Eyes round. Body iron gray, with the whole or part of the head yellow. Belly white. Lateral line straight. Anal fin with 22 rays. Tail entirely truncate.

*Silurus xanthocephalus*, Monogr. sp. 10.

About a foot long. In the Ohio, Kentucky, etc. Head very large, often entirely yellow, or only forward, or covered with yellow patches. Iris white. Fins fleshy reddish. The dorsal with 1 and 6 rays, caudal 24. Good food.

‡ Body scaleless, conical, flattened forwards and compressed behind. Head very broad and flat, with barbs, eyes above the head. Two dorsal fins, both with soft rays. Vent posterior.

This genus was the 10th of my Prod. of 70 N. G. of animals. The name means Mudfish. It differs principally from the foregoing by the second dorsal having rays.



\* 80th species, Toad Mudcat, *PYLCDICTIS LIMOSUS*, *Pylodictes bourbeux*. (p. 67.)

*PELODICHTHYS OLIVARIS* (Raf.) G. & J.

† XXIV. Genus, BACKTAIL, *NOTURUS*, *Noture*. (p. 67.)

‡ 81st species, Yellow Backtail, *NOTURUS FLAVUS*, *Noture jaune*. (p. 68.)

*NOTURUS FLAVUS* Raf.

XXV. Genus, TOTER, *HYPENTELIUM*, *Hypentele*. (p. 68.)

82d species, Ohio Toter, *HYPENTELIUM MACROPTERUM*, *Hypentele macroptere*. (p. 68.)

*HYPENTELIUM NIGRICANS* (Le Sueur.) Jor.

*Catostomus nigricans* Le Sueur (young).

*Hylomyzon nigricans* (Le S.) Ag.

*Hypentelium nigricans* (Le S.) Jordan.

Description very good. If *Catostomus nigricans* be considered generically distinct from *C. hudsonius*, we have no alternative but to substitute *Hypentelium* for *Hylomyzon* of later date.

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\* Lower jaw longer, eyes round, eight barbs, four above and four below. Head verrucose above. Body brown, clouded, and dotted with yellowish, reddish, and bluish; one row of transversal black lines on each side of the back. No lateral line. Tail entire and truncate.

I have not seen this fish, but describe it from a drawing of Mr. Audubon. It is found in the lower part of the Ohio and in the Mississippi, where it lives on muddy bottoms, and buries itself in the mud in the winter. It reaches sometimes the weight of 20 pounds. It bears the name of Mudcat, Mudfish, Mud-Sucker, and Toadfish. It is good to eat, and bites at the hook. The head is broader than the body, and with a very large mouth; the barbs appear to lie in four pairs, two above, longer and near the nostrils, and two smaller under the lower jaw. The first dorsal fins triangular and above the abdominals, which are nearer the pectorals than to the anal. Second elongate with many rays. Number of rays unnoticed.

† Difference from *G. Pimelodus*, *S. G. Ictalurus*, and sect. *Ameiurus*: Adipose dorsal fin very long, decurrent, and united with the tail, which is decurrent on each side, but unconnected with the anal fin.

Genus 18th of the Prodr. N. G. It differs from the genus *Plotosus* of Lacépède by having the anal fin free, and from *Pimelodus* by the connection of the tail with the second dorsal fin. The name means "tail over the back". The *Silurus gyrinus* of Mitchill must belong to this genus.

‡ Entirely yellowish. Upper jaw longer, barbs half the length of the head. Eyes round. Lateral line nearly straight. Anal fin with 14 rays. Tail entirely truncate.

A small species, very common near the falls. Length 4 to 12 inches. It agrees in almost everything with the section *Ameiurus* among the Catfishes. Vulgar name Yellow Catfish, like the *Pimelodus cupreus*. Dorsal fin with 1 and 7 rays, rounded spine very short and obtuse. Second dorsal beginning before the anal and extending to the tail in a curve. All the lower fins rounded. Pectorals with 1 and 7 rays, spine equal and acute. Abdominal fins with 8 rays. All the fins fleshy and fat. Head flat above. Barbs unequal. Belly convex. Hind part of the body compressed.

## XXVI. Genus, RIBBON-FISH, SARCHIRUS, Sarchire. (p. 69.)

83d species, Ohio Ribbon-Fish, SARCHIRUS VITTATUS, Sarchire rubanne. (p. 69.)

*Lepidosteus* sp. (young).

Description inaccurate.

## \* XXVII. Genus, PIKE, ESOX, Brochet. (p. 70.)

† 84th species, Streaked Pike, ESOX VITTATUS, Brochet raye. (p. 70.)

Thus far unrecognized.

‡ 85th species, Sa'mon-Pike, ESOX SALMONEUS, Brochet saumonne. (p. 71.)

## ESOX SALMONEUS Raf.

? *Esox umbrosus* Kirtland.

Description probably second hand and not very good. It is probably *Esox umbrosus*, which species abounds in the bayous of the Ohio, but

\* Body cylindrical or very long, covered with small scales, vent posterior. One dorsal fin behind the abdominal fins. Mouth large, jaws long and flattened, with very strong teeth; opening of the gills very large. Head bony, scaleless. Tail not oblique. All the fins with rays.

There are several species of Pikes in the Ohio, Mississippi, Wabash, Kentucky, &c. I have not yet been able to observe them thoroughly. I have, however, procured correct accounts and figures of two species; but there are more. They appear to belong to a peculiar subgenus distinguished by a long dorsal fin, a forked tail, and the abdominal fins anterior, being removed from the vent. It may be called *Picorellus*. The French settlers of the Wabash and Missouri call them *Piconeau*, and the American settlers Pikes or Pickerels. They are permanent but rare fishes, retiring, however, in deep waters in winter. They prefer the large streams, are very voracious, and grow to a large size. They prey on all the other fishes except the Gar-fishes, &c. They are easily taken with the hook, and afford a very good food, having a delicate flesh.

† White, with two blackish longitudinal streaks on each side, back brownish; jaws nearly equal, very obtuse, eyes large and behind the mouth; dorsal fins longitudinal between the abdominal and anal fins; tail forked.

*E. vittatus*. Raf. in American Monthly Magazine 1818, volume 3, page 447.

This fish is rare in the Ohio (although it has been seen at Pittsburgh), but more common in the Wabash and Upper Mississippi. It is called *Piconeau* or *Picaneau* by the Canadians and Missourians. It reaches the length of from three to five feet. The pectoral and abdominal fins are trapezoidal, the anal and dorsal longitudinal with many rays and nearly equal. It is sometimes called Jack or Jackfish. Lateral line straight.

‡ White, with many narrow transversal brown bands, somewhat curved; jaws nearly equal, very obtuse; dorsal fins brown, longitudinal and extending over the anal fins; tail forked and brown.

It is one of the best fishes in the Ohio; its flesh is very delicate, and divides easily, as in Salmon, into large plates as white as snow. It is called Salmon Pike, White Pike, White Jack or White Pickerel, and *Picaneau blanc* by the Missourians. It has a short and thick head, eyes not very large, and situated upwards. Pectoral and abdominal fins trapezoidal. Dorsal fin beginning behind these last and extending over the anal. The number of transversal bands is twelve or more, rather distant, and with the concavity towards the head. It reaches the length of 5 feet. Lateral line nearly straight.

the statement that it "reaches the length of 5 feet" renders the identification doubtful. I have never seen it more than a foot long. The name *Picorellus* may be retained for the section of *Esox*, which has the cheeks and opercles entirely scaly, if a subgeneric name for that group is considered desirable.

**XXVIII. Genus, GARFISH, LEPISOSTEUS, Lepisoste.** (p. 71.)

1st subgenus, **CYLINDROSTEUS.** (p. 72.)

86th species, Duck-Bill Garfish, **LEPISOSTEUS PLATOSTOMUS**, Lepisoste platostome. (p. 72.)

**LEPIDOSTEUS PLATYSTOMUS** Raf.

Description fair.

87th species, White Garfish, **LEPISOSTEUS ALBUS**, Lepisoste blanc. (p. 73.)

Probably same as preceding.

88th species, Ohio Garfish, **LEPISOSTE OXYURUS**, Lepisoste oxyure. (p. 73.)

**LEPIDOSTEUS OSSEUS (L.)** Ag. (probably).

89th species, Long-Bill Garfish, **LEPISOSTEUS LONGIROSTRIS**, Lepisoste longirostre. (p. 74.)

**LEPIDOSTEUS OSSEUS (L.)** Ag.

2d subgenus, **ATRACTOSTEUS.** (p. 75.)

*Atractosteus* Grd. and authors.

*Litholepis* Raf. Am. Monthl. Mag. 1818, III, 447.

90th species, Alligator-Garfish, **LEPISOSTEUS FEROX**, Lepisoste feroce. (p. 75.)

**LITHOLEPIS SPATULA (Lacép.)** Jor.

*Atractosteus ferox* (Raf.) Grd.

*Litholepis adamartinus* Raf.

Description pretty good. The generic name *Litholepis*, having two years' priority, must supersede *Atractosteus*. The specific name *spatula* (Lacépède) antedates both *adamartinus* and *ferox*.

\* **XXIX. Genus, DIAMOND-FISH, LITHOLEPIS, Litholepe.** (p. 76.)

\* Body fusiform, covered with hard, stony pentaedral scales, vent nearly medial. Abdominal fin near the vent. One dorsal fin opposite the anal. Head bony, scaleless, protruded anteriorly in a long snout; mouth beneath the head; jaws not elongated, with strong unequal teeth. Opening of the gills very large. Tail not obliquial. All the fins with rays.

A very singular genus, which comes very near to the last genus, but differs by the snout, mouth, tail, scales, &c. It must belong, however, to the same family. The name means *Stony Scales*.

\* 91st species, Devil-Jack Diamond-fish, **LITHOLEPIS ADAMANTINUS**, *Litholepis adamantin.* (p. 76.)

**LITHOLEPIS SPATULA** (Lac.) Jor.

Description at second hand and erroneous in several respects, but unquestionably referring to the Alligator-Gar.

**XXX. Genus, EEL, ANGUILLA**, Anguille. (p. 77.)

Subgenus **CONGER**. (p. 77.)

† 92d species, Broad-Tail Eel, **ANGUILLA LATICAUDA**, Anguille large queue. (p. 77.)

**ANGUILLA VULGARIS** Fleming.

*Anguilla bostoniensis* (Le Sueur) Dekay and of authors.

*Anguilla rostrata* (Le Sueur) Dekay (the earliest American name).

If, as is claimed by Dareste, there is but one species of *Anguilla* in the northern hemisphere, the four species of Rafinesque belong to it. *Murana rostrata* (Le S.), applied to the eel of the inland lakes of New York, is the oldest American name.

93d species, Black Eel, **ANGUILLA ATERRIMA**, Anguille noire. (p. 78.)

94th species, Yellow-Belly Eel, **ANGUILLA XANTHOMELAS**, Anguille xanthomele. (p. 78.)

\* Snout obtuse, as long as the head; head one-fourth of total length; body fusiform blackish; dorsal and anal fins equal and with many rays; tail bilobed, lateral line obsolete.

*Litholepis adamantinus* Raf. in American Monthly Magazine 1818, vol. 3, p. 447, and in *Journal de Physique et Hist. Nat.* 70, N. G. d'Animaux G. 20.

This may be reckoned the wonder of the Ohio. It is only found as far up as the falls, and probably lives also in the Mississippi. I have seen it, but only at a distance, and have been shown some of its singular scales. Wonderful stories are related concerning this fish, but I have principally relied upon the description and figure given me by Mr. Audubon. Its length is from 4 to 10 feet. One was caught which weighed 400 pounds. It lies sometimes asleep or motionless on the surface of the water, and may be mistaken for a log or a snag. It is impossible to take it in any other way than with the seine or a very strong hook, the prongs of the gig cannot pierce the scales which are as hard as flint, and even proof against lead balls! Its flesh is not good to eat. It is a voracious fish. Its vulgar names are Diamond Fish (owing to its scales being cut like diamonds), Devil Fish, Jack Fish, Garjack, &c. The snout is large, convex above, very obtuse; the eyes small and black; nostrils small, round before the eyes; mouth beneath the eyes, transversal with large angular teeth. Pectoral and abdominal fins trapezoidal. Dorsal and anal fins equal, longitudinal, with many rays. Tail obtusely and regularly bilobed. The whole body covered with large stone scales, lying in oblique rows; they are conical, pentagonal and pentaedral, with equal sides from half an inch to one inch in diameter, brown at first but becoming of the color of turtle shell when dry. They strike fire with steel! and are ball proof!

† One individual of this species poisoned once slightly a whole family, causing violent colicks, which was ascribed to its having been taken in the vitriolic slate rocks of Silver Creek, near the falls.—(Raf.)

95th species, Yellow Eel, *ANGUILLA LUTEA*, Anguilla jaune. (p. 78.)

**XXXI. Genus, STURGEON, ACCIPENSER, Eturgeon.** (p. 76.)

1st subgenus, *STURIO* (5 rows of plates). (p. 79.)

96th species, Spotted Sturgeon, *ACCIPENSER MACULOSUS*, Eturgeon tachete. (p. 79.)

*ACCIPENSER MACULOSUS* Le S. and authors.

97th species, Shovel-Fish Sturgeon, *ACCIPENSER PLATORHYNCHUS*, Eturgeon pelle. (p. 80.)

*SCAPHIRHYNCHOPS PLATYRHYNCHUS* (Raf.) Gill.

2d subgenus, *STERLETUS* (3 rows of plates). (p. 80.)

98th species, Fall Sturgeon, *ACCIPENSER SEROTINUS*, Eturgeon tardif. (p. 80.)

This and the next are probably *Acipenser rubicundus* Le Sueur, but I can throw no new light on this perplexing subject.

99th species, Ohio Sturgeon, *ACCIPENSER CHIENSIS*, Eturgeon de l'Ohio. (p. 81.)

100th species, Big-Mouth Sturgeon, *ACCIPENSER MACROSTOMUS*, Eturgeon beant. (p. 81.)

**XXXII. Genus, DOUBLE-FIN, DINECTUS, Dinecte.** (p. 82.)

A sturgeon with "two dorsal and no abdominal fins".

101st species, Flat-Nose Double-Fin, *DINECTUS TRUNCATUS*, Dinecte camus. (p. 82.)

Description from a drawing by Mr. Audubon, which represents, as suggested by Rafinesque, "only a sturgeon incorrectly drawn".

**XXXIII. Genus, SPADE-FISH, POLYODON, Polyodon.** (p. 82.)

102d species, Western Spade-Fish, *POLYODON FOLIUM*, Polyodon feuille. (p. 82.)

*POLYODON FOLIUM* Lacépède.

Description mainly correct.

**XXXIV. Genus, PADDLE-FISH, PLANIROSTRA, Planirostre.**

103d species, Toothless Paddle-Fish, *PLANIROSTRA EDENTULA*, Planirostre edente. (p. 83.)

*POLYODON FOLIUM* Lacépède (adult).

XXXV. Genus, LAMPREY, PETROMYZON, Lamproie. (p. 84.)

\* 104th species, Black Lamprey, PETROMYZON NIGRUM, Lamproie noire. (p. 84.)

AMMOCETES NIGER (Raf.) Jor.

*Petromyzon niger* Grd.

Description insufficient, but I am unable to find that the common little Black Lamprey of the West has received any other name.

SUPPLEMENT. (p. 85.)

† XXXVI. Genus, SPRING-FISH, PEGEDICTIS, Pegedicté. (p. 85.)

ETHEOSTOMA Raf. Gill & Jordan emend.

CATONOTUS Agassiz.

‡ 105th species, Cat's-Eye Spring-Fish, PEGEDICTIS ICTALOPS, Pegedicté œuil de chat. (p. 85.)

ETHEOSTOMA FLABELLARIIS Raf.

Description indifferent. The characters indicate a species of Darter, and the eight dorsal spines point to the *flabellaris*.

6th genus, ETHEOSTOMA. (p. 85.)

106th species, Springs Hogfish, ETHEOSTOMA FONTINALIS, Etheostome des fontaines. (p. 86.)

ETHEOSTOMA FLABELLARIIS Raf.

Description very good.

\* Entirely blackish, tail oval acute, second dorsal over the vent, several rows of teeth.

A very small species, from 4 to 5 inches long; it is found as high as Pittsburgh. Dorsal fins shallow, and distant from each other and the tail. Eyes round and large. Branchial holes small. No lateral line. Mouth oval, teeth white and yellow. It torments sometimes the Buffalo-fish and Sturgeons upon which it fastens itself. It is never found in sufficient quantity to be used as food.

† Body conical, with *small scales*, belly flat, vent medial. Head broad, scaleless, gill covered with a membranaceous appendage and a concealed spine, mouth toothed. Two dorsal fins, the first with simple, soft, semi-spinescent rays. Thoracic fins with five rays.

This new genus belongs to the family *Percidia* and has many affinities with the *G. Holocentrus*, *Lepomis*, *Etheostoma*, &c., but its conical form and many other secondary peculiarities distinguish it completely. The name means Fountain-fish.

‡ Jaws equal, forehead knobby, eyes elliptical. Body *olivaceous with some black transversal unequal brown bands*; a concealed spine on the gill cover; lateral line straight; tail elliptical. The first dorsal fin with 8 rays, the second with 12, as well as the anal and pectoral fins.

I have discovered this species in the summer of 1820 near Lexington. It has no vulgar name. Length hardly 2 inches. Head large, brown, convex above, with several small knobs on the forehead, flat beneath. Eyes as in the Catfishes with oblong eyes, iris gilt brown. Spine of the gill cover concealed under the skin. Teeth small and acute. *Pectoral fins large lanceolate*. Belly white and flat. Fins hyalin with some brown spots. Five transversal bands. The specific name means cat's eye.

17th genus, **SEMOTILUS**. (p. 86.)

\* 107th species, Silver-Spotted Chubby, **SEMOTILUS ? NOTATUS**, *Semotile tache*. (p. 86.)

**ZYGONECTES NOTATUS** (Raf.) Jor.

*Zygonectes olivaceus* (Storer) Agassiz.

This description evidently refers to some Cyprinodont fish. The translucent spot on the head of *Zygonectes* is so characteristic and conspicuous in life that I have no doubt that Rafinesque had that common species in mind.

26th genus, **SARCHIRUS**. (p. 86.)

† 108th species, Silver Ribbon-Fish, **SARCHIRUS ? ARGENTEUS**, *Sarchire argente*. (p. 86.)

Unidentifiable.

Description erroneous and insufficient.

31st genus, **ACCIPENSER**. (p. 86.)

109th species, Gourd-Fish Sturgeon, **ACCIPENSER LAGENARIUS** Etur-geon gourde. (p. 86.)

? *Polyodon folium*.

Description second hand and erroneous.

**XXXVII. Genus, SAWFISH, PRISTIS, Poisson-scie**. (p. 86.)

110th species, Mississippi Sawfish, **PRISTIS MISSISSIPPIENSIS**, *Poisson-scie du Mississippi*. (p. 86.)

**PRISTIS ANTIQUORUM** Shaw.

Passable description (of the saw only).

‡ **XXXVIII. Genus, HORNFINN, PROCEROS, Proceros**. (p. 87.)

\* Breadth one-sixth of the length, brownish, pale beneath; head small obtuse with a large silver spot on the forehead before the eyes, jaws nearly equal; dorsal fin opposed to the anal, tail oboval entire.

It is found in the Cumberland River and the Little River, a branch of it. Communicated by Mr. Wilkins. It is rather doubtful whether it belongs to this genus, or *Minnilus*, *Rutilus*, &c. It might perhaps be found to constitute a peculiar one by the small mouth without lips, and the posterior dorsal fin. Vent posterior. Pectoral and abdominal fins oboval. Eyes large. Length 3 inches; good bait for Perch, Bass, Red-eyes or Ring-eyes, &c.

† Entirely silvery, without bands or spots.

Communicated by Mr. Owings. It is found in Licking River, Slate Creek, &c. Length from two to three feet. It is called Pike, and may be one, but as it is described without scales and very slender, I have added it to this genus until it is better known.

‡ Apodal. Body elongated. Vent posterior. One dorsal fin opposed to the anal. Mouth beneath transversal toothed. Snout protruded in a straight horn. Four spiracles or branchias on each side.

Singular new genus of the family of Sharks or *Antacea*, from which however it differs by the want of abdominal fins. There are two species of it; the second, which I have called *Proceros vittatus*, lives in Lake Ontario, and has longitudinal stripes.

\* 111th species, Spotted Horn-Fish, *PROCEROS MACULATUS*, *Proceros tachete*. (p.87.)

A myth; description evidently second hand. What fish, if any, suggested it is past my guessing.

#### IV.—LIST OF SPECIES NOT NOTICED BY RAFINESQUE.

The following species occurring in the valley of the Ohio, most of them within a radius of one hundred miles from Lexington, do not seem to have been noticed by Rafinesque. These species are given upon the authority of the present author unless otherwise noted. In case no particular locality is mentioned, the species is supposed to be generally diffused. Various other nominal species have been described from the Ohio Valley, but I omit all of whose validity I am not reasonably certain.

*Microperca punctulata* Putnam.—White River, Indiana.

*Boleichthys eos* Jordan & Copeland.—Wabash River.

*Pæclichthys variatus* (Kirt.) Ag.—Everywhere.

*Pæclichthys spectabilis* Ag.

*Nanostoma zonalis* (Cope) Jor.—Miami River (Cope).

*Nothonotus camurus* (Cope) Jor.

*Nothonotus sanguifluus* (Cope) Jor.—Cumberland River (Cope).

*Nothonotus maculatus* (Kirt.) Ag.

*Pleurolepis pellucidus* Ag.

*Alvordius aspro* Cope & Jordan.

*Ericosma evides* Jordan & Copeland.—White River.

*Rheocrypta copelandi* Jor.—White River.

*Imostoma shumardii* (Grd.) Jordan.—Wabash River.

*Diplesium simoterum* (Cope) Copeland.—Rock Castle River.

*Alvordius phoxocephalus* (Nelson) Cope & Jor.—Wabash River.

*Percina manitou* Jor.—Wabash River.

*Sandrus canadensis* (Smith) Jor.—Ohio River. Introduced.

*Stizostethium vitreum* (Mit.) Jord.—Ohio River. (Introduced.?)

*Morone interrupta* Gill.—Lower Ohio.

*Centrarchus irideus* (Lac.) C. & V.—Lower Ohio.

*Pomoxys nigromaculatus* (Le Sueur) Grd.—White River. Scarce.

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\* Iron grey, with white spots on the sides; tail forked; horn one-fourth of total length.

This fish lives in the Mississippi, and is sometimes caught at St. Genevieve, in the State of Missouri. The French settlers call it *Poisson arme*. It has no scales, but its head is bony. Eyes very small. Dorsal and anal fins rounded. Length 2 or 3 feet; very good to eat. Communicated by Mr. M——, of St. Genevieve.



- Chaenobryttus gulosus* (C. & V.) Cope.—Wabash River.  
*Lepiopomus pallidus* (Mit.) Gill & Jord.—Everywhere.  
*Lepiopomus anagallinus* (Cope.)—Salt River, Kentucky.  
*Xenotis inscriptus* (Ag.) Jor.—White River.  
*Xenotis aureolus* Jor.  
*Eupomotis pallidus* (Ag.) Gill & Jor.—Lower Ohio.  
*Eupomotis aureus* (Walb.) Gill & Jor.—Introduced. (?)  
*Asternotremia isolepis* Nelson.—Southern Illinois.  
*Aphododerus cookianus* Jordan.—Wabash River.  
*Potamocottus bairdii* (Grd.) Gill.—Muskingum River. (Grd.)  
*Potamocottus carolinæ* Gill.—Cave Region, etc.  
*Potamocottus wilsoni* (Grd.) Gill.—White River.  
*Lota lacustris* (Walb.) Gill.—Rare. Introduced. ?  
*Labidesthes sicculus* Cope.—Abundant.  
*Zygonectes dispar* Ag.—Wabash River.  
*Fundulus diaphanus* (Le S.) Ag. (?)  
*Melanura limi* (Kirt.) Ag.—Scarce.  
*Amblyopsis spelæus* Dek.—Caves.  
*Typhlichthys subterraneus* Grd.—Caves.  
*Chologaster agassizii* Putnam.—Caves.  
*Percopsis guttatus* Ag.—Rare. (Introduced. ?)  
*Exoglossum maxillingua* (Le S.) Hald. (? ?)  
*Hybognathus argyritis* Grd.  
*Hybognathus nuchalis* Ag.  
*Ericymba buccata* Cope.—Abundant.  
*Nocomis dissimilis* (Kirt.) Cope & Jor.—Common.  
*Rhinichthys obtusus* Ag.—Common.  
*Phenacobius teretulus* Cope.—West Virginia. (Cope.)  
*Phenacobius uranops* Cope.—Rock Castle River.  
*Luxilus storerianus* (Kirt.) Jordan—Kentucky. (Grd.)  
*Luxilus stramineus* (Cope) Jordan.—White River.  
*Luxilus tuditanus* (Cope) Jordan.—Wabash River. (Cope.)  
*Luxilus galacturus* (Cope) Jordan.—Abundant.  
*Luxilus coccogenis* (Cope) Jordan.—Cumberland River.  
*Cliola scabriceps* (Cope.) Jor.  
*Cliola ariomna* (Cope) Jor.—White River, etc.  
*Cyprinella analostana* (Grd.) Jordan.  
*Photogenis spilopterus* Cope.—Wabash River.

- Nototropis photogenis* (Cope) Jor.—Ohio R.  
*Nototropis rubrifrons* (Cope) Jor.—Abundant.  
*Nototropis rubellus* (Ag.) Jor.—Abundant.  
*Nototropis dilectus* (Grd.) Jor.—Falls of Ohio.  
*Nototropis micropteryx* (Cope) Jor.—Rock Castle River.  
*Myxostoma breviceps* Cope.—Ohio River.  
*Placopharyx carinatus* Cope.  
*Carpiodes bison* Ag.  
*Carpiodes difformis* Cope.  
*Carpiodes cutisanserinus* Cope.  
*Bubalichthys bubalinus* Jor. (*Cat. bubalus* Kirt. not of Raf.)  
*Ichthaelurus furcatus* (Val.) Gill.  
*Ichthaelurus robustus* Jor.  
*Amiurus natalis* (Le S.) Gill.  
*Noturus miurus* Jordan.  
*Noturus liacanthus* Jor.  
*Noturus lemniscatus* (Le S.) Grd.—Ohio.  
*Noturus exilis* Nelson.—Southern Illinois.  
*Amia calva* L.  
*Ammocætes argenteus* (Kirt.) Jor.—Common.

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